COMMODORE USERS

Ahoy!

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JANUARY 1989



Ahoy!

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Cover art by James Regan and Steven Sellors; photography by Michael R. Davila

ISSUE NO. 61 JANUARY 1989

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• Action Replay allows you to Freeze the action of any memory Resident Program and make a complete back-up to disk or tape – but thats not all . . . . Just compare these features

❑ Simple Operation: Just press the button at any point and make a complete back-up of any* memory resident program to tape or disk.

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❑ Unique Picture Save: Freeze and save any Hires Screen to tape or disk. Saved in Koala, Blazing Paddles Format.

ONLY $59.99

UNIQUE FEATURES:

❑ WARP 25

Loads 50K in under 5 seconds!!

Yes it true action replay features 'Warp 25' the world's fastest disk serial Turbo. A typical backup will reload in under 5 seconds.

● No additional hardware required ● No special formats ● Super reliable ● Remember this is not a system where files have to be converted – with action replay you simply save directly into Warp 25 status – reload in seconds. ● Backup all your existing programs to load at unbelievable speed!! ● Because AR4 has on board ram it can also load commercial disks directly at 25 times speed.

This is unique to Action Replay!!

● Warp Save/Load Available straight from Basic.

❑ Plus unique Code Cracker Monitor

● Freeze any program and enter a full machine code monitor ● Full Monitor Features – Dissasemble, Hex, Find, Jump, Compare, Replace, Two Way Scroll, Full Disk Load/Save, Printer Support etc. In fact all usual monitor commands plus a few others. ● Because of Action Replay's on Board Ram the Frozen program can be looked at in it's ENTIRETY: – In it's Frozen state. That means Video Ram, Zero Page etc. and remember you see the code in it's Frozen state not in a Reset state as with competitors products. ● Restart the program at any point. ● No corruption ● An absolute must for the program Hacker – make changes and see your result's instantly!

POWERFUL DESIGN WITH ON BOARD LSI LOGIC PROCESSOR CHIP PLUS 40K OF ON BOARD ROM/RAM!

❑ Compactor: Efficient compacting techniques – 3 programs per disk side – 6 programs if you use both sides.

❑ Single File: All programs saved as a single file for maximum compatibility.

❑ Utility Commands: A host of additional commands: – Autonum, Append, Old, Delete, Linesave, Printer Lister

❑ Screen Dump: Print out any Screen to Host or Printers. 16 Gray Scales, Double size print options.

❑ Unstoppable Reset: Reset button to Rectrieve System and Reset even so called Unstoppable Programs

❑ Fully Compatible: Works with 1541/C, 1581, 1571 and Datacassette with C64,128, 128D (in 64 Mode)

❑ Compatible: With Fast DOS and Turbo Rom Systems

❑ Disk Utilities: Fast Format, Directory, List, Run and many other key commands are operated by Function Keys

❑ Unique Restart: Remember all of these utilities are available at one time from an integrated operating system. A running programme can be Frozen to enter any Utility and the program is restarted at the touch of a key – without corruption.

LSI Logic Processor: This is where Action Replay IV gets it's power. A special custom LSI chip designed to process the logic necessary for this unmatched Freeze/Restart power. No other cartridge has this power!

❑ Action Replay Graphics Support Disk

To help take advantage of action replay's unique power to freeze any screen and save it into your favourite graphics package we have prepared a suite of graphic support facilities.

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CENTRONICS PRINTER LEAD

❑ Take full advantage of Action Replay or Final Cartridge screen dump features with this centronics lead.

❑ Connects user port to any full size Epson compatible printer.

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❑ SUPERCRUNCHER

❑ A utility to turn your Action Replay into a super powerful program compactor. Reduce programs by up to 50%! Save disk space and loading times. Can even further compact programs already crunched by Action Replay's own compactor.

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NOW WITH RAMLOADER™

❑ Not only can Action Replay load your backups at 25 times normal speed . . . Now with the new RAMLOADER feature you can also load most of your commercial originals also at 25 times faster!!

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- Unique picture print dump – compressed/ enlarged Plus other effects.
- Fast loader – loads commercial software at up to 15 times normal speed.
- Range of desk-top type tools – clock, calculator, desktools etc. etc.
- Final Cartridge 3 is a superb utilities cartridge with an added bonus of a freezer function.

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TOOLKIT IV

The ultimate disk toolkit for the 1540/1541

- A disk toolkit is an absolute must for the serious disk hacker. Toolkit IV has more features than most for less.
- DISK DOCTOR V2 – Read and write any track and sector including extra and renumbered tracks. Repair damaged sectors. Look underneath read errors.
- HEADER/GAP EDITOR – Decodes and displays ALL header information including off bytes and header gap. Rewrite the entire header and header gap. Renumber sectors. Also edit any sector tail gap.
- DISK LOOK – Sort directory. Recover lost files. Display file start/end addresses. Disassemble any file program directly from the disk to SCREEN or PRINTER including undocumented opcodes. Edit Bam. Much. much more.
- FILE COMPACTOR – Can compact machine programs by up to 50%. Saves disk space. Compacted programs run as normal.
- FAST DISK COPY – Copy an entire disk in 2 minutes or less using single 1541.
- FAST FILE COPY – Selective file copy. Works at up to 6 times normal speed.
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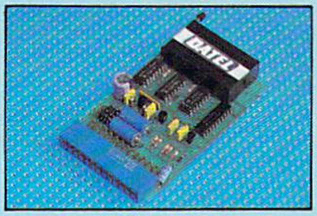
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- Comes complete with instructions – plus the cartridge handbook.

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DEEP SCAN BURST NIBBLER™

- The most powerful disk nibbler available anywhere, at any price!
- Burst Nibbler is actually a two part system – a software package **and** a parallel cable to connect the 1541/1570/1571 to 64/128 (state type).
- What gives Burst Nibbler its power? Conventional nibblers have to decode the data from the disk before it can transfer it using the serial bus – when non standard data is encountered they are beat. Burst Nibbler transfers data as raw GCR code via the parallel cable without the need to decode it so you get a perfect copy of the original.

● Will nibble upto 41 tracks. ● Copy a whole disk in under 2 minutes. ● Full instructions. ● Regular updates – we always ship the latest. ● Fitted in minutes – no soldering usually required. ● Full cr $^1{}_2$ tracks. ● No need to buy parallel cable if you have Professional DOS etc. ● Cable has throughbus extension for other add ons.

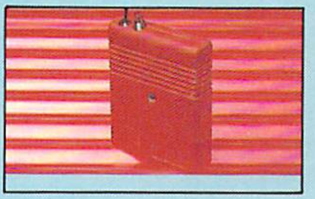
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SOFTWARE ONLY $19.99 CABLE ONLY $19.99

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☐ Burst Nibbler is the most powerful Nibbler around – but even the best can be better ☐ This disk contains dozens of parameters specially written for the protection schemes impossible to Nibble. These are mainly 'V-max' and 'Rapidlock' and include titles such as 'Defender of the Crown', Gauntlet etc. ☐ Regularly updated to include any new titles. ☐ This disk is by no means a necessity – the standard Burst Nibbler will copy 98% of software as is – if you want to go to the limits, this is the product for you!

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SMART CART

- NOW YOU CAN HAVE A 32K CARTRIDGE THAT YOU PROGRAM LIKE RAM THEN ACTS LIKE ROM!
- 32K pseudo ROM – battery backed to last up to 2 years (lithium battery).
- Simply load the program you require – then flick the switch. The cartridge then acts like a ROM cartridge and can even be removed.
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- I/02 slot open for special programming techniques.

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- Makes entire backups in 8 seconds!!
- Multiple copies from one original – over 250 disks per hour. Full verify option.
- Copies upto 40 tracks and can cope with standard disk errors 21-29.
- The most price effective method of mass duplication available.

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● Slimline extra low profile unit – only 6" long! ● Top quality NEC drive mechanism. ● Throughport allows daisychaining other drives. ● A superbly styled case finished in amiga colours. ● Fully compatible. ● 1 meg unformatted capacity. ● Good length cable for positioning on your desk etc. ● Complete – no more to buy.

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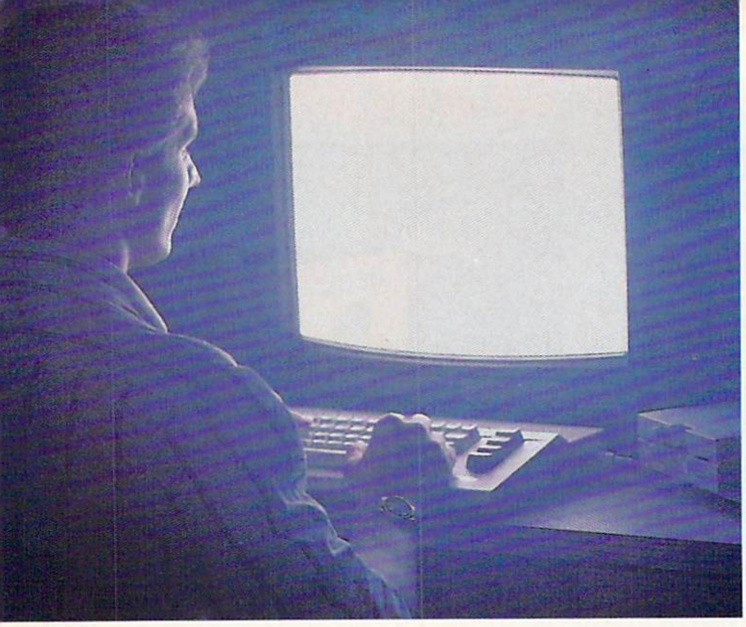
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VIEW FROM THE BRIDGE

Think fast—what were you doing five years ago this month?

When you work in publishing, a question like that is easy to answer. Five years ago from the time we write these words, we were putting the final touches on the first edition of a new magazine. And five years ago from the time you read these same words, the first issue of *Ahoy!* went on sale.

Though it probably didn't show, editors Tim Moriarty, Bob Sodaro, and the undersigned spent the better part of three months planning and assembling that premier issue—sort of a "spare time" project in between editions of *Videogaming & Computergaming Illustrated.* Our early evening sessions were frequently interrupted by an engineer named Morton Kevelson who would ride the subway up after work, loaded down with half-inch thick stacks of fanfold paper he called reviews and carousels full of color slides of disemboweled hardware. Programmers David Barron, Michael Kleinert, and Pete Lobl, whose combined ages would barely qualify them to run for President, hung around after school and answered some of the three *Ahoy!* editors' more complex technical questions, like: "How do you turn the C-64 on?" Richard Herring, Dale Rupert, and others lent their expertise from afar. Somehow, that first issue went off to the printer, and the staff wondered—would it fly? (Or "sail," as we immediately corrected ourselves.) All except for Michael Schneider, who spent a lot of time reading sales reports on the Commodore 64—and smiling.

Our first cover story, titled "Can the 64 Crack the Peanut?" concerned the threat posed to Commodore by IBM's coming entry in the home computer market. (Historical postscript: HA!) The issue also featured our first programs—the *Multi-Draw 64* graphics system and the *Interrupt Music Maker/Editor.* If you wanted to use either program, you had a hard way to go. You couldn't buy them from us on disk (though you probably didn't own a disk drive anyway). There was no *Bug Repellent* to help you out (not until Issue 4). It occurred to no one to print our phone number in case readers encountered problems. And, yes, there were problems—a nasty bug in each program.

Also in that issue—the first *Rupert Report*, titled "Don't Curse that Cursor!"; fourteen pages of new products; nine pages of reviews; the first *Commodares* (and the only one not written by Dale Rupert); an editorial by Ben Bova; and articles on C-64 memory and sequential file programming.

Readers who joined us much later can't imagine how exciting those early months were. It seemed that every month brought news of yet another product that took the 64 someplace no one had ever imagined it could go. Remember the advent of speech synthesizers? Dual and one megabyte disk drives? Hardware attachments for applications like weather forecasting, home security, and stress management?

It's true that today's home computers make daily strides that dwarf anything in the C-64's history. But if you were there, you understand why watching the progress of the Amiga or the Macintosh could never be as exciting as growing up with the 64.

We are deeply honored by the role you've allowed us to play in that growing process. Chronicling the progress of the Commodore home computers these past five years has been exciting; the sense that our efforts are appreciated, gleaned from thousands of letters and phone calls, has been gratifying.

Fortunately, the 64 and 128 are still going places where no one imagined they could—and we wouldn't miss it (or the chance to tell you about it) for the world! *—David Allikas*

SCUTTLEBUTT

SECURITY SYSTEM • MIDI PROCESSOR • PSYCHOLOGY SOFTWARE • MINIMODEM • TAX PROGRAM UPDATE • ERASEABLE LABELS • READING HELP • GAMES FROM KONAMI, DISCOVERY, MASTERTRONIC • PRINTER GEOS CHART MAKER • FAX ON COMPUSERVE • AD&D UTILITY

READING HELP

Readup has released the second in its series of Supplemental Diskettes for use with their *Accelerated Reader* reading comprehension program. Like the previous installment (Diskette 101-150), Diskette 151-200 contains tests for 50 books for second to sixth graders. The Supplemental Diskettes are available to present users or new purchasers of the *Accelerated Reader* for $50 each. The entire *Accelerated Reader* package for the C-64 lists for $300.

Readup Inc., 800-338-4204 or 715-887-2333 (see address list, page 14).
Circle #230 on Reader Service Card



The second supplemental disk for **The Accelerated Reader** *contains tests for 50 children's books. Among the titles included are Socks, The TV Kid, Ramona Forever, Stuart Little, Justin and the Best Biscuits in the World, 4B Goes Wild, The Comeback Dog, and The Castle in the Attic.*

COMPUTER ON PATROL

Total Security ($29.95) allows the 64 or 128 to be used as an alarm system. Up to 10 sensors (not included, but readily available at electronics stores) can be wired to a joystick cord to detect entry, serve as temperature alarms, etc. The program sounds an audible alarm over the monitor speaker and dials any two phone numbers (modem required) when a violation occurs, and also prints out the time and area of the violation.

Megasoft Canada, 705-746-8081 (see address list, page 14).
Circle #227 on Reader Service Card

ANOTHER RETURN

Nothing is certain in life except death, taxes, and a new version of *Taxaid.* For the eighth consecutive year, the income tax preparation program for the C-64, 128, and Plus/4 has been updated, this time to include all the current tax law changes for tax year 1988. The program prepares IRS Form 1040, Schedules A-E and SE, and Form 2441 (Child Care). Calculations are automatic, and all tax tables are built in. Printout is in IRS-approved format on plain paper. Price is $49.95; updates for 1989 will be available for $18.00.

Taxaid Software, Inc., 218-834-5012 (see address list, page 14).
Circle #228 on Reader Service Card

MODERN MIDI

RTX8, a MIDI processor for the C-64, is now available in version 5.0. Designed for the live performance musician who needs simultaneous multichannel access from a single MIDI keyboard, the program includes a utility for live patch number translation, "panic buttons," MIDI data monitor, and other features. The program will run with any MIDI keyboard with any number of multitimbral synthesizers connected to a C-64 with a standard MIDI interface.

Realtime Music Publishing (see address list, page 14).
Circle #229 on Reader Service Card

SMALL TALK

The direct connect, Hayes- and 1670-compatible Minimodem-C can run virtually any terminal software for the 64 or 128. The 300/1200 baud unit, which measures only 5 x 2.75 x 0.75", sports a complete set of status indicator lights. The Hayes AT command set is supported and software-selectable; default settings are switchable via internal DIP switches. "S" register status and result codes, plus several modes of autotest,

CHIP LEVEL DESIGNS PRESENTS

128 mode & CP/M version now available!

- RapiDOS -

THE SUPER-FAST PARALLEL DISK OPERATING SYSTEM FOR THE COMMODORE 64 AND 1541 DISK DRIVE!

- All disk access is handled at super-fast parallel speed! (LOAD, SAVE, directory, SEQ & REL files, scratch, validate, format).
- Designed to support multiple drive systems.
- Parallel Centronics printer support with file spooling capability.
- Many useful, timesaving features (DOS Wedge, screen dump, resident monitor).
- No loss of compatibility.
- Far too many features to list in this ad . . . and perhaps in this magazine! (Call or write to get all the details!)

. . . and if you want the ultimate, get RapiDOS Professional!

- Gives even faster disk access!
- Uses 8k RAM track buffering and hardware GCR conversion!
- Provides 40 track extension (749 blocks free!)
- Adds 20 new disk commands (i.e., lock files, change disk name).

Here's what people are saying about RapiDOS:

Mike J. Henry (Basement Boys Software) - *"It's amazing how incredibly fast it is, I'm impressed!"*
Mitch S. (Eaglesoft Inc.) - *"Very fast, very reliable, and very compatible. I love it!"*
J.F. Jones (ADP) - *"Superbases' speed is increased greatly, and it's now a dream to use!"*

Function	Normal DOS	RapiDOS	RapiDOS Pro	Your System
Load 202 blocks	128 sec.	15 sec.	3 sec.	
Save 202 blocks	196 sec.	98 sec.	8 sec.	
Format 35 tracks	90 sec.	24 sec.	18 sec.	

Compare these speeds with your current system and see why RapiDOS puts the C-64 into a different league!

RapiDOS requires a socketed kernal ROM U4, and is available in versions for the 64c, 128 in 64 mode, and 1541c (please specify when ordering). RapiDOS is easily upgradeable to the Professional Version. RapiDOS Professional drive controller is **(c) '87 mts data GbR,** the creators of the best European parallel systems.

At these affordable prices no C-64 owner should be without RapiDOS!

RapiDOS $49.95 RapiDOS Professional $99.95

MASS DUPLICATOR 1541

- For the C64/128 with a single 1541 disk drive.
- 15 second, 4 pass backup for standard disks!
- 25 second full GCR Super Nibbler, the most powerful yet!
- 9 second disk format!
- Fast loader!
- Quick installation.
- Can be upgraded to RapiDOS

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MASS DUPLICATOR MSD

- A must for any MSD SD-2 owner.
- 15 second standard disk backup!
- 18 second full GCR Quick Nibbler!
- 9 second disk format!

$25.95

MSD AUTO COPY ROM

- Adds new Fast Backup commands!
- Turns the MSD SD-2 into a dedicated copying drive (no computer needed).

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C-64 BURST-ROM

- Gives the 64 'Burst Mode' when used with a 1571 or 1581 disk drive!
- Loads 100 blocks in 6 seconds on a 1571, 4 seconds on a 1581!
- Fast directory, SEQ, and REL file access!
- Built in DOS wedge!
- Simple installation. (Kernal ROM U4 must be socketed)

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C-128 BURST-ROM

- Lets the 128 run at 'Burst' speed when in 64 mode!
- Provides the same features as the C-64 Burst-ROM!

$49.95

STILL TO COME

- MSD SD-1 Fast Copier!
- 1571 Mass Duplicator!
- 1581 Utility Pack!

TURBO 64

- Speed-up cartridge for the C-64, just plug it in!
- Adjust the clock rate from 100 khz (1/10 normal) to 4 mhz (4x normal)!
- Uses 8/16 bit 65816 microprocessor (same as the Apple][gs... but twice as fast)!
- Spread sheets, BASIC, flight sims, graphics, and now GEOS... all are accelerated!

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Minimodem-C has all the features of many larger units, but the 5 x 2.75 x 0.75" unit fits neatly behind the computer, occupying almost no desk space.

are also standard. Line responses can be heard through the built-in piezo speaker. Operational modes include 2 wire full duplex, auto dial, auto answer, auto redial, busy tone detect, and dial tone detect.

The $74.95 price includes *Multiterm* software and a free trial hour on CompuServe. A two-week trial and a one-year warranty are also given.

Aprotek, 805-482-3604 (see address list, page 14).
Circle #234 on Reader Service Card

CHART WITH GEOS

geoChart ($29.95) allows you to import data from any *GEOS* program *(GEOS 1.2/1.3/2.0, GEOS 128, geoFile, geoCalc,* etc.) to create charts. Nine types are available, including pie, unibar, area, point, line, column, bar, scatter point, and scatter line; chart type can be changed without reentering data. Up to 80 values can be charted (4 data series of 20 points each), or more via a mechanism for selecting subsets of values to plot. 32 fill patterns are provided for pie, area, unibar, bar, and column charts, along with 4 marker types for scatter point and scatter line charts. Text and percentage values can be displayed or hidden.

Berkeley Softworks, 415-644-0883 (see address list, page 14).
Circle #256 on Reader Service Card

FAX ON FILE

Users of CompuServe's EasyPlex and InfoPlex electronic mail services can now send messages directly from their computers to facsimile machines anywhere in the world, without having to produce a printed document first. Price within the 50 states is 75¢ for the first 1000 characters and 25¢ for each additional 1000 characters (50,000 character limit on EasyPlex). International prices are based on the destination country and the length of the message.

CompuServe, 614-457-8600 (see address list, page 14).
Circle #257 on Reader Service Card

DISK LABEL KIT

Erase-a-Label eliminates the need to peel outdated labels off your diskettes. You affix one of the super-adhesive, curlproof labels to your disk, and write on it with the special pen provided. When it comes time to change the information on your label, the ink wipes off with a dab of alcohol.

Erase-a-Label, 214-387-9303 (see address list, page 14).
Circle #233 on Reader Service Card

CLEAR THE WATERS

If you've found Strategic Simulations' *Pool of Radiance* to be about as clear as Boston Harbor, a new clue book can help you with this first in SSI's series of AD&D-based fantasy role-playing games. The book is a complete player's guide with maps of every location in the game, and descriptions of all major encounters, as well as passwords, mazes, and illusions. Included are specific tactics for surviving the game's most challenging encounters, strategies



No more stacking labels so high that you can't squeeze your disk into the drive—with the Erase-a-Label system you can reuse the same one indefinitely.

for successful combat, and information about which combinations of character classes and races make the best adventurers.

Strategic Simulations Inc., 415-964-1353 (see address list, page 14).
Circle #258 on Reader Service Card

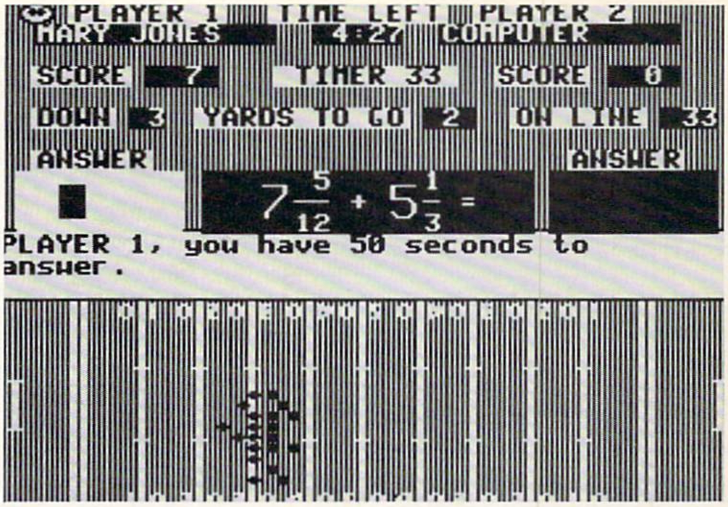
SHRINKWRAPPED?

The Mindware Catalog consists of 32 pages of psychologically interactive software from various publishers, some of which is available for the C-64. Included are *Mind Mirror, IntraCourse, Eliza*, and others along those lines. A copy will be sent free upon request.

Mindware Catalog, 408-429-1676 (see address list, page 14).
Circle #232 on Reader Service Card

AD&D AID

A utility program for use with the Advanced Dungeons & Dragons board game, *Dungeon Master's Assistant, Volume I: Encounters* can reduce a Dungeon Master's prep time by several hours per session. The disk contains a database of over 1000 encounters and over 1300 monsters and characters, including all monsters from the AD&D Monster Manuals I and II. DMs can modify the existing data or add their original monsters and encounters to the database. Aided by the power of the computer, this program finally makes it possible to utilize the vast number of monsters and encounters created for AD&D play.



Math Football: Fractions ***lets kids experience all the thrills and excitement of an arithmetic drill while they learn about football. (Wait a second...)***

Strategic Simulations Inc., 415-964-1353 (see address list, page 14).
Circle #259 on Reader Service Card

3¼, 8⅓, 26½...HIKE!

Math Football: Fractions can be played by one or two students at one of four levels: High School (addition and subtraction of fractions), College (addition and subtraction of mixed numbers), Pro (multiplication and division of fractions and mixed numbers), and Super Bowl (mixed operations). On each play, the student opts for a running play (easy problem), short pass (medium problem), long pass (hard problem), or punt. Correct answers result in yardage gained, first down, touchdowns, and extra points; incorrect answers, in loss of yards or possession. Teachers can set time limits for answering problems and store up to 200 names on the disk. Available for the C-64 on either 3½" or 5¼" disk for $44.95; with backup, $54.95; class pack (10 disks), $164.95.

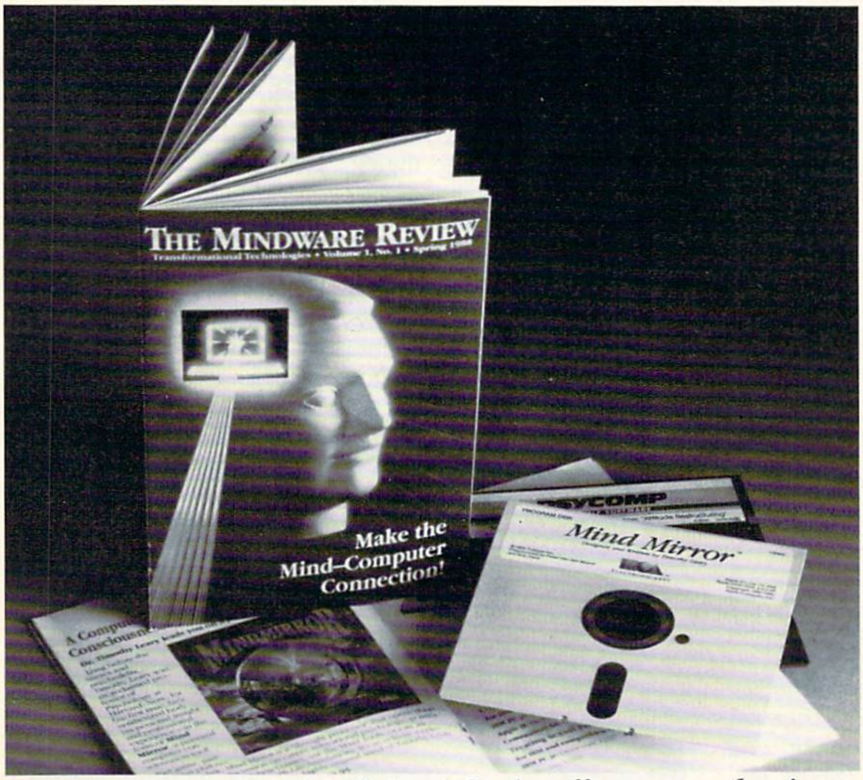
Gamco, 800-351-1404 or 915-267-6327 (see address list, page 14).
Circle #231 on Reader Service Card

GAMES

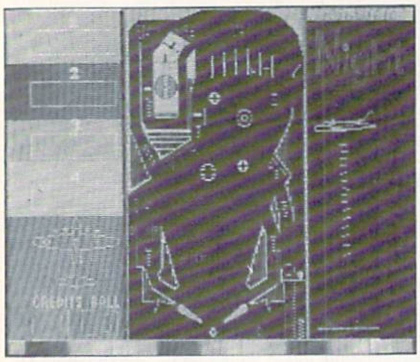
The latest in Accolade's Avantage series of mid-priced games, *Jet Boys* ($14.95) lets one or two players take the role of a jetpack-equipped commando whose mission is to enter and deactivate an enemy-controlled reactor room. First the player must survive numerous waves of attacks by galactic terrorists. In the two-player "cooperative" mode, players pool their resources and fight the bad guys together. There are four levels of play; to advance from each level, the player must destroy a megabeast that blocks the way.

Accolade, 408-296-8400 (see address list, page 14).
Circle #236 on Reader Service Card

Adapted for the 64 by Mastertronic, *Barbarian* makes the player run a gauntlet of over 20 different enemies and traps in more than 300 animation sequences in front of 48 hi-res back-



Available upon request, The Mindware Catalog offers a comprehensive selection of previously released software of a psychologically interactive nature.



Night Mission Pinball *on the rebound.*

ground scenes. After reaching his goal and defeating the all-powerful Necron, the player has to fight his way out of a maze before the Necron's domain crumbles around him.

Mastertronic International, 714-631-1001 (see address list, page 14).
Circle #237 on Reader Service Card

Fusing fantasy role-playing and arcade action, *Times of Lore* ($39.95) embroils the player in continual combat with assassins, wizards, and monsters. Along the way, your hero-for-hire character meets and holds conversations with over 60 unique individuals. The graphically depicted game world includes over 45 different buildings to explore among its cities, towns, towers, and dungeons. The program is said to load 15 times faster than most games, with each of the three game segments completely memory-resident. Play book and full color map are included.

ORIGIN, 603-644-3360 (see address list, page 14).
Circle #261 on Reader Service Card

SubLOGIC has re-released *Night Mission Pinball,* out of print for several years. The game includes ten modes of play, including Easy, Competition, Slow Motion, and Cosmic (warped motion and sound effects).

SubLOGIC, 217-359-8482 (see address list, page 14).
Circle #262 on Reader Service Card

Two coin-op conversions to the 64 from Capcom U.S.A.:

The *Bionic Commando* is a soldier in a future world who is turned into an unstoppable commando by advanced bionics. He must use his power to force a path through the fortress headquarters of the enemy.

Street Fighter stars a pair of martial artists, Ryu and Ken, who travel the globe to take on opponents in Japan, England, America, China, and Thailand. The fighters jump, flip, and stoop to avoid enemy blows, and counter with kicks and punches.

Capcom U.S.A., 408-745-7081 (see address list, page 14).
Circle #238 on Reader Service Card

In *Skyfox II: The Cygnus Conflict* ($29.95) the Terran Federation is once again being threatened by Xenomorphs. The enemy have retreated to the dark space of the Cygnus constellation where they've established starbases. The player must accept the role of Federation Warpwarrior and defend the earth with the advanced Skyfox II warpfighter. The single player game offers varying levels of difficulty and 10 possible battle situations. After each mission, player performance is evaluated by a Mission Summary Screen. Warpwarriors who complete their mission successfully can choose to go on to a new one; those who fail can retry the same one.

Electronic Arts, 415-571-7171 (see address list, page 14).
Circle #239 on Reader Service Card

Who Framed Roger Rabbit attempts to recreate the humor and adventure of the film. While trying to stop Judge Doom from destroying Toontown, players must race Benny the Cab through the streets of Tinseltown, retrieve the missing will at the Ink and Paint Club, and use gags to get past the evil weasels at the Gag Factory. Players keep track of their progress with an onscreen map, and receive animated prizes from characters like Jessica Rabbit via a series of reward screens. A Quick Start Card for easy beginning play and a full-color poster are included.

Buena Vista Software, 818-569-7397 (see address list, page 14).
Circle #240 on Reader Service Card

Typhoon of Steel ($49.95), sequel to SSI's *Panzer Strike!,* spans the Pacific, Asian, and European theaters of WWII. Practically every ground weapon used in those theaters is included, from tanks, tank destroyers, and artillery to trucks, mortars, and machine guns. Pillboxes, minefields, dragon's teeth, flamethrowers, and naval gun support are also included. Players can simulate single battles or recreate an entire campaign, with the computer creating maps and determining the type of battles and offensive/defensive missions.

Strategic Simulations Inc., 415-964-1353 (see address list, page 14).
Circle #235 on Reader Service Card

Acquired by Discovery from British-based Electra Software, *Better Dead Than Alien* ($34.95) is a humorous space shoot-em-up casting the player as galactic hero Brad Zoom. He must battle endless waves of slithering and crawling aliens, some easily destroyed, some far more dangerous and deadly. A simultaneous two-player mode is included.

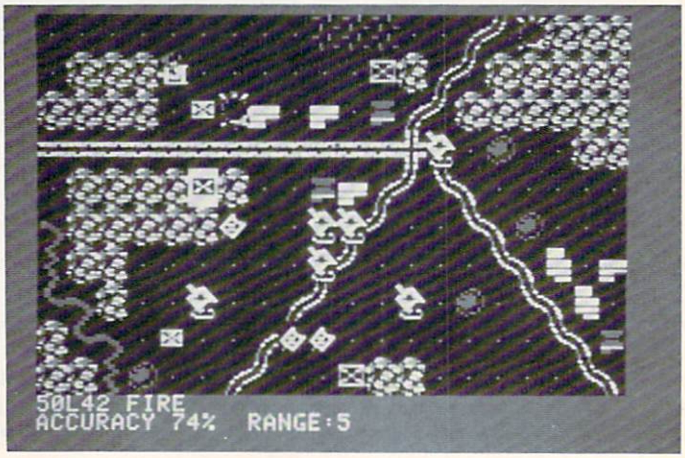
Discovery Software, 301-268-9877 (see address list, page 14).
Circle #241 on Reader Service Card

Five games coming from Konami during the remainder of 1988 and 1989:

Ajax engages players in aerial combat with jet fighters, tanks, helicopters, ships, and aircraft carriers.

Castlevania pits the player against ghosts, goblins, demons, and the like, culminating in a face to face battle with Count Dracula.

Typhoon of Steel *lets players accurately recreate individual battles or full campaigns from the European, Asian, and Pacific theaters of WW II.*



Metal Gear requires players to steel their nerves for a clash with Vermin CaTaffy, whose weapon of destruction endangers the world.

In *Life Force* players fight with ripple lasers and plutonic missiles to prevent their world from becoming lunch for Zelos, the planet-eating alien.

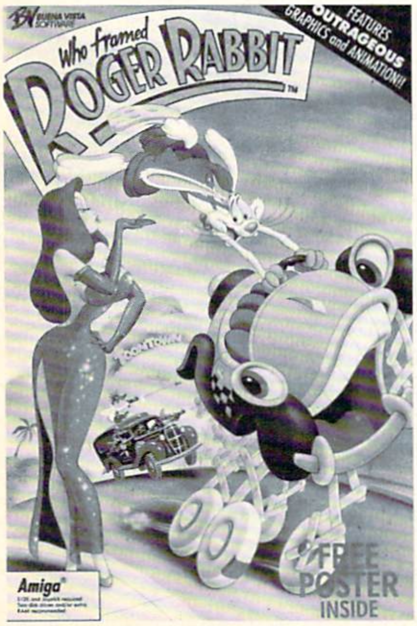
Teenage Mutant Ninja Turtles teams players with the amphibious "heroes in the half shell" of comic book fame to fight off the evil Foot Clan in the sewers of New York.

Konami Inc., 312-595-1443 (see address list, page 14).
Circle #242 on Reader Service Card

To *Escape from Planet X* you must first escape the operating table of the mad Prof. Schism, who plans to let you leave in several jars. From there, the text adventure will lead you through alien jungles, ancient cities, and other locales, culminating with the blowing up of the planet.

The game offers the option of control through voice command when using the Covox Voice Master or Voice Master Jr. The player trains the program to recognize his voice, then issues all commands through the Voice Master microphone, without using the keyboard. The game is included with Voice Master ($89.95) and Voice Master Jr. ($49.95), or available separately for $19.95.

Covox Inc., 503-342-1271 (see address list, page 14).
Circle #269 on Reader Service Card



Deriving its name from the Atlantic City casino, *Trump Castle* ($34.95) includes black jack, roulette, craps, keno, video poker, and nine different slot machines. Included in each package are $250 worth of discount coupons for use at the hotel and casino.

IntraCorp, 305-252-9040 (see address list, page 14).
Circle #270 on Reader Service Card

An alien named *Maniax* ($14.95) is the only chance the world has against a dragonlike creature that has enveloped the earth's cities in smoke.

Anco Software, Inc., 412-947-3922 (see address list, page 14).
Circle #271 on Reader Service Card

C-128 SKETCHING

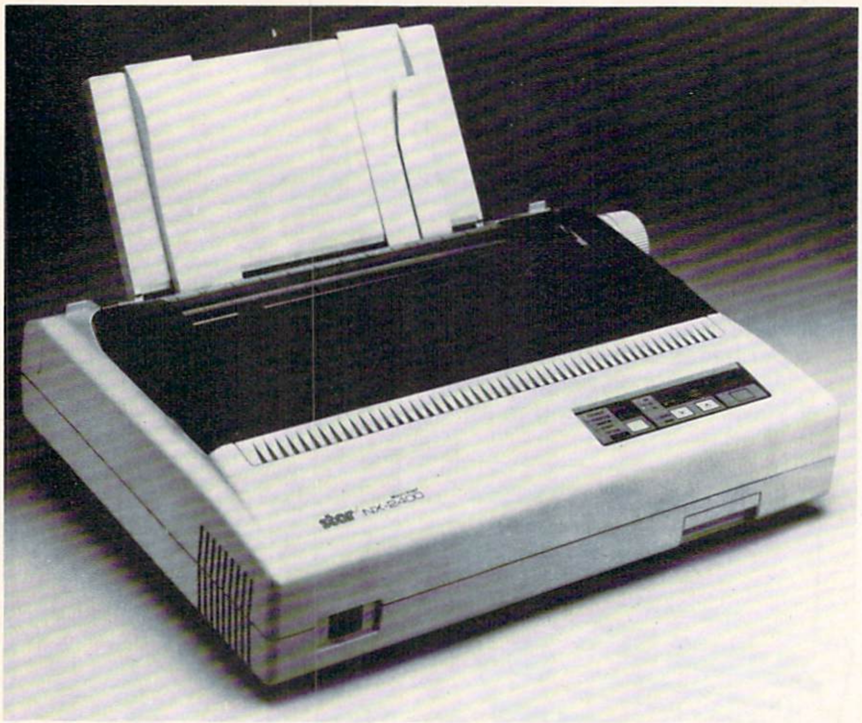
Sketchpad 128 ($29.95) lets users of the C-128 and 1351 mouse create 80 column artwork, slide shows, signs, and posters on a 640 x 200 pixel drawing screen. Features include smooth freehand drawing, 3-D solids (spheres, columns, donuts, spools), shaded fill patterns, Enlarge, Scroll Screen, and Slideshow options, a wide range of drawing tips, and a variety of provided fonts. The program offers 100% compatibility with BASIC 8.0 files, and *Print Shop* graphics can be utilized directly from *Print Shop* disks. Users with 64K Video RAM can take advantage of the program's pixel editor, grid maker, and advanced drawing modes (such as Air Brush).

Free Spirit Software, 215-683-5609 (see address list, page 14).
Circle #272 on Reader Service Card

NEW PRINTER

Designed for business correspondence, the 24-wire NX-2400 Multi-Font ($529) prints at 170 cps in draft elite mode and 57 cps in letter quality elite mode. In addition, the printer offers a 360 by 360 dpi graphics resolution. The standard 7K buffer can be expanded to 39K with an optional 32K RAM card. The four resident fonts are Courier, Prestige, Orator, and Script; three more (Letter Gothic, Blippo, and OCR B) can be had through optional font cards. Italic printing is available for all fonts and pitches. The front panel offers selection of paper park and other printer features.

Star Micronics, 212-986-6770 (see address list, page 14).



Star's NX-2400 Multifont has four resident typefaces, with three more available.

Companies Mentioned in Scuttlebutt

Accolade
550 S. Winchester Blvd.
San Jose, CA 95128
Phone: 408-985-1700

Anco Software
P.O. Box 292
Burgettstown, PA 15021
Phone: 412-947-3922

Aprotek
1071-A Avenida Acaso
Camarillo, CA 93010
Phone: 805-482-3604

Berkeley Softworks
2150 Shattuck Avenue
Berkeley, CA 94704
Phone: 415-644-0883

Buena Vista Software
3800 West Alameda Ave.
Burbank, CA 91505
Phone: 818-569-7397

Capcom USA
1283-C Mountain View
Sunnyvale, CA 94089
Phone: 408-745-7081

CompuServe
5000 Arlington Center Blvd.
P.O. Box 20212
Columbus, OH 43220
Phone: 614-457-8600

Covox, Inc.
675-D Conger Street
Eugene, OR 97402
Phone: 503-342-1271

Discovery Software
163 Conduit Street
Annapolis, MD 21401
Phone: 301-268-9877

Electronic Arts
1820 Gateway Drive
San Mateo, CA 94404
Phone: 415-571-7171

Erase-a-Label
13717 Welch Road
Dallas, TX 75244
Phone: 214-387-9303

Free Spirit
P.O. Box 128
58 Noble Street
Kutztown, PA 19530
Phone: 215-683-5609 or 800-552-6777

Gamco Industries
Box 911
Big Spring, TX 79721
Phone: 1-800-351-1404; in Texas 915-267-6327

IntraCorp Inc.
14160 SW 139th Court
Miami, FL 33186
Phone: 305-252-9040

Konami
815 Mittel Drive
Wood Dale, IL 60191
Phone: 312-595-1443

Mastertronic
Mesa Business Center, Unit 9G
711 West 17th Street
Costa Mesa, CA 92627
Phone: 714-631-1001

MegaSoft Canada
P.O. Box 10
Parry Sound, Ont.
P2A 2X2 Canada
Phone: 705-746-8081

Mindware Catalog
1803 Mission St.
Santa Cruz, CA 95060-5296
Phone: 408-429-1676

ORIGIN
136 Harvey Rd., Bldg. B
Londonderry, NH 03053
Phone: 603-644-3360

Readup, Inc.
P.O. Box 95
Port Edwards, WI 54469
Phone: 715-887-2333

Realtime Music
P.O. Box 8144
Loveland, CO 80537

Star Micronics
200 Park Ave., Suite 3510
New York, NY 10166
Phone: 212-986-6770

Strategic Simulations
1046 N. Renstorff Ave.
Mountain View, CA 94043
Phone: 415-964-1353

SubLOGIC
501 Kenyon Road
Champaign, IL 61820
Phone: 217-359-8482

Taxaid Software
606 Second Avenue
P.O. Box 100
Two Harbors, MN 55616
Phone: 218-834-5012

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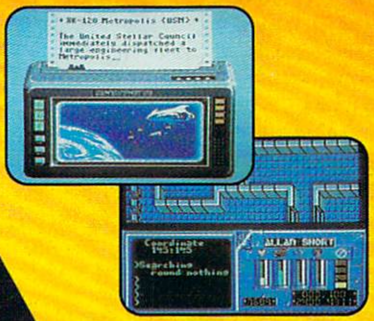


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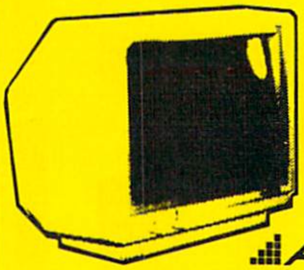
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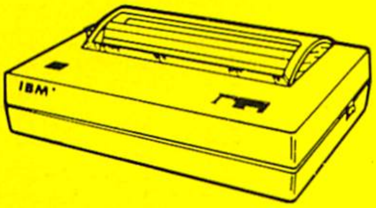
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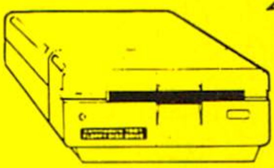
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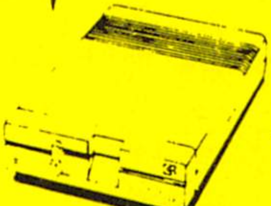
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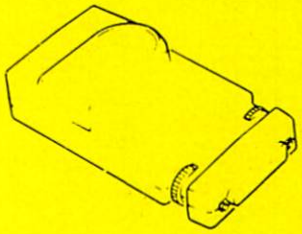
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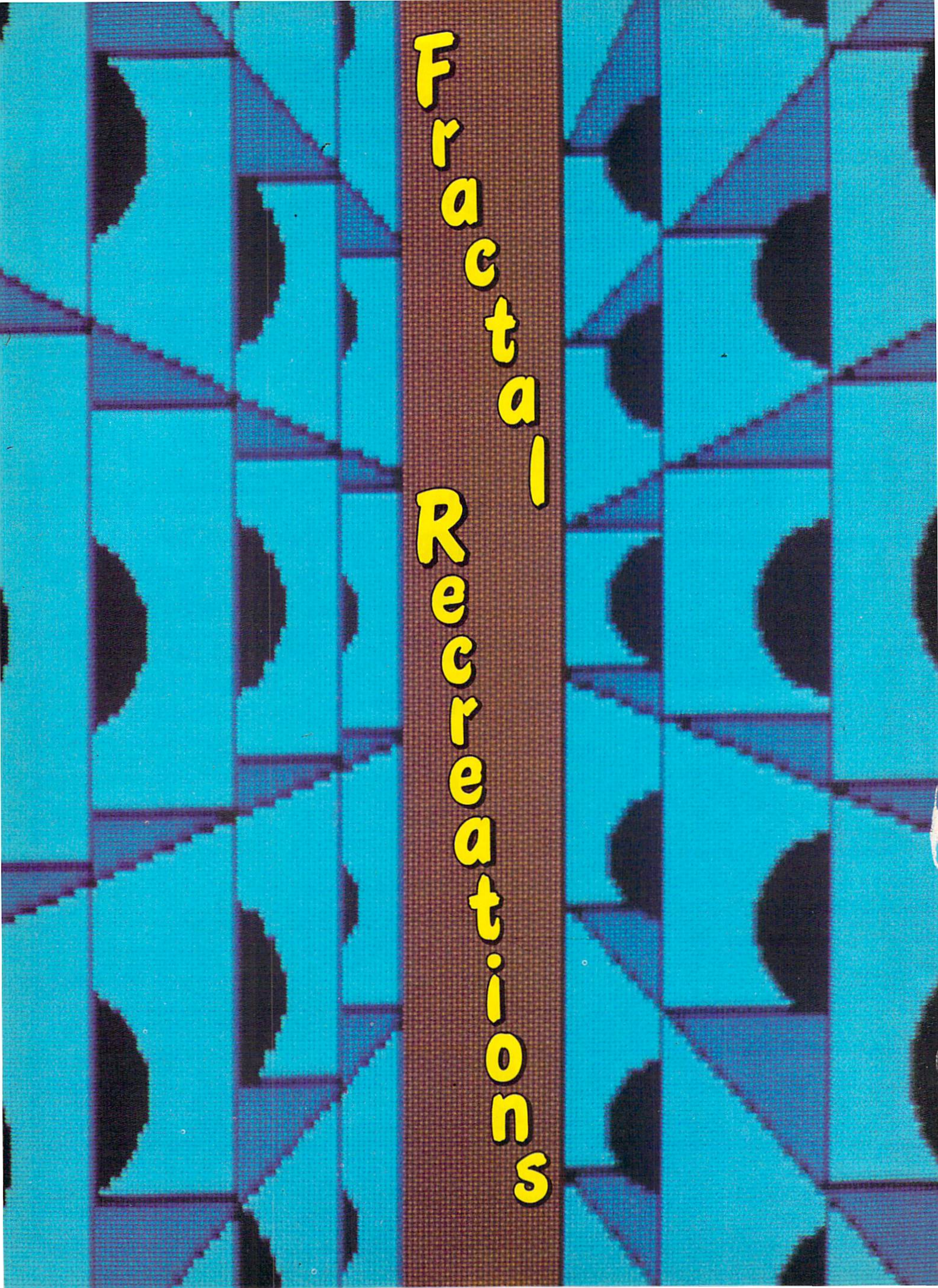
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Fractal
Recreations

The 320 by 200 dot image on the high resolution screen represents 64,000 pixels. To store such an image normally requires at least 8000 bytes of data (more if colors are included). This month we will discuss a technique based upon fractal compression by which some very complex images can be represented with as few as 14 floating-point numbers. Watching the images appear from apparent randomness is an interesting experience. The process of encoding your own images can be a true intellectual challenge.

This month's title *Fractal Recreations* is meant to be interpreted two ways. In the first sense, we will discuss algorithms and programs for encoding and recreating complex images which are represented by means of a concise, fractal-compressed storage scheme. In the second sense, you should find (literally) hours of entertainment experimenting with these thought-provoking concepts.

The ideas and algorithms discussed here are derived from a wonderful book, *The Science of Fractal Images* (Springer-Verlag, 1988) edited by Peitgen and Saupe. In particular Chapter 5 of that book written by Michael Barnsley, and an article based upon the same ideas by Barnsley and Alan Sloan in *Byte* magazine (January 1988), provide the details and programming examples which are herein adapted and clarified.

The image-generating program in this article is written for the C-128. C-64 users must provide a high-resolution pixel plotting routine and modify the program accordingly. We have presented programs and procedures in previous *Rupert Reports* which allow C-64 users to plot high-resolution graphics on their machines (see *Ahoy!* June '85, July '85, and January '88), and you should refer to them.

CREATING IMAGES

Having the computer restore compressed images on the screen is the easy part. Select a line number for the RESTORE statement in line 20 of the program *Fractal Decoder* (on page 69) corresponding to a set of DATA statements for the desired image. Then type RUN.

At first an initialization screen appears. During this time, the computer is calculating the first 100 points of the image without displaying them. The program is determining the approximate range of horizontal and vertical values which are to be plotted. The image will then be automatically scaled to fit the screen.

The main loop of the program continues calculating new points for the specified image, and it plots them on the high-resolution (320 by 200) graphics screen. If a point is calculated which would be off the screen, it is displayed at the screen boundary, and the image size calibration values are updated.

If after a while it appears that some of the image is off the screen, you may change the size of the image. Simply press the space bar. The latest image size calibration values are then used to redefine the image size. The old image is erased, and the main loop continues plotting points. Now the entire image (or at least more of it) should fit on the screen.

The points comprising the image appear on the screen in a controlled but random order. How can that be? The general region of the image in which to plot a point is picked at random. The specific point in that region is calculated from the previously plotted point as well as from the values listed in the DATA statement for the image.

The main loop of the program generating these complex images (from lines 440 to 620) is surprisingly simple. Lines 470-510 randomly pick a value of J from 1 to JMAX. JMAX is the number of transformations which define the selected image. JMAX is the first item in the DATA statements for each image.

Each compressed image is stored as a collection of transformations. Each transformation is represented by six numbers. Also, each transformation has a "weighting" or probability associated with it. Thus there are seven numbers given for each transformation. We will investigate transformations later when we learn how to encode an image into this compressed form.

Lines 520-540 use the randomly chosen J value to pick and combine the set of values A(J) through F(J) corresponding to one transformation. The horizontal coordinate of the next point to be plotted is calculated in line 520 (NX). The vertical coordinate is calculated in line 530 (NY). These calculations depend upon the selected transformation coefficients (A(J) - F(J)) as well as the previous X and Y values. The current X and Y values are saved in line 540 for use the next time around.

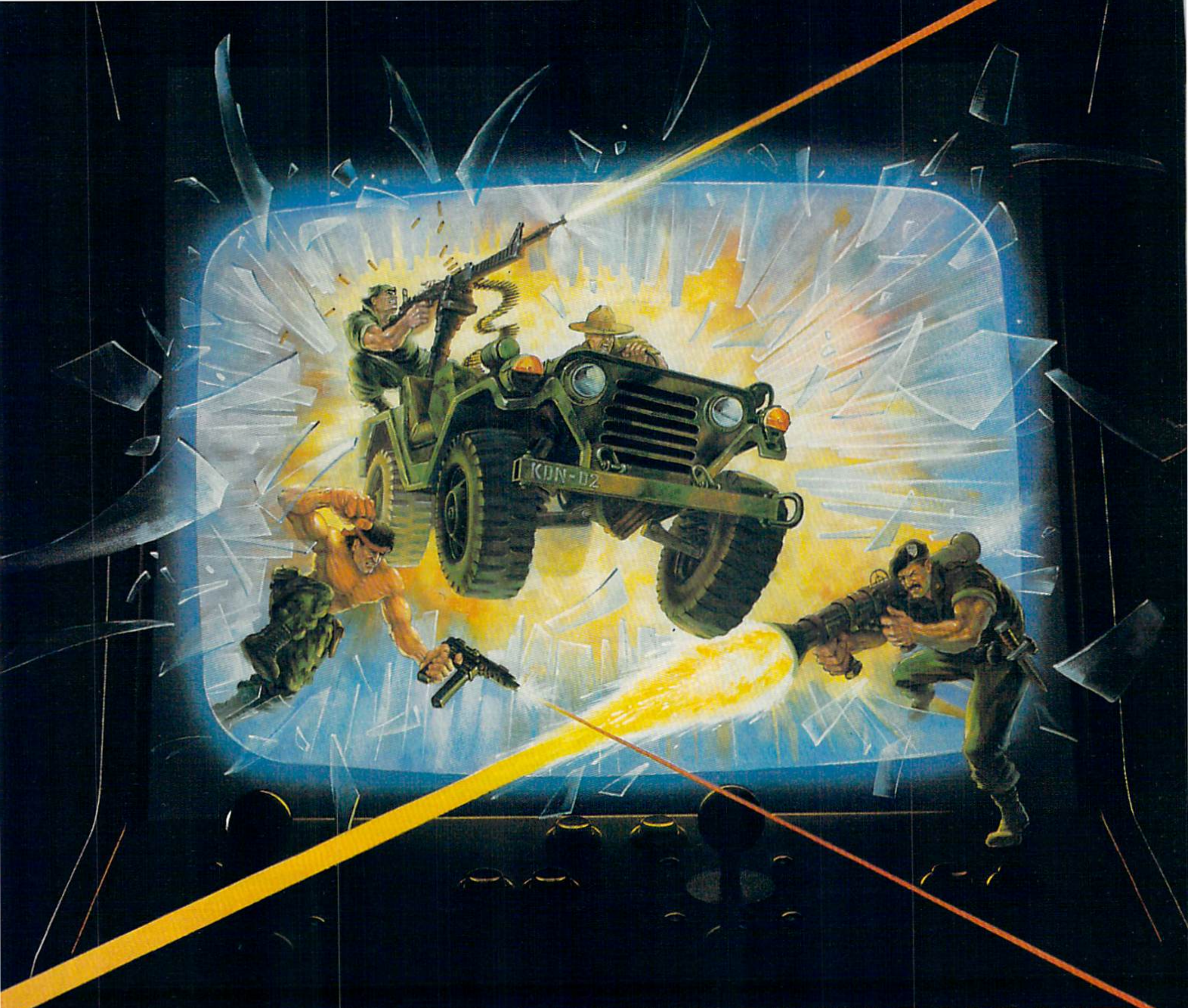
Line 550 scales the calculated point according to the graphics window size calculated during initialization. Any points which are off the screen are drawn at the edge of the screen. Also in lines 560-590 the minimum or maximum coordinate parameters are updated for any point which lies off the screen.

The point is plotted in line 600. Details of the graphics window calibration and scaling formulas are presented in *Windows, Viewports, and a Moebius Strip (Rupert Report,* September 1986 *Ahoy!).* If no key is pressed, the loop start-

Compressed Complex Images

By Dale Rupert

ART BY STEVEN SELLORS



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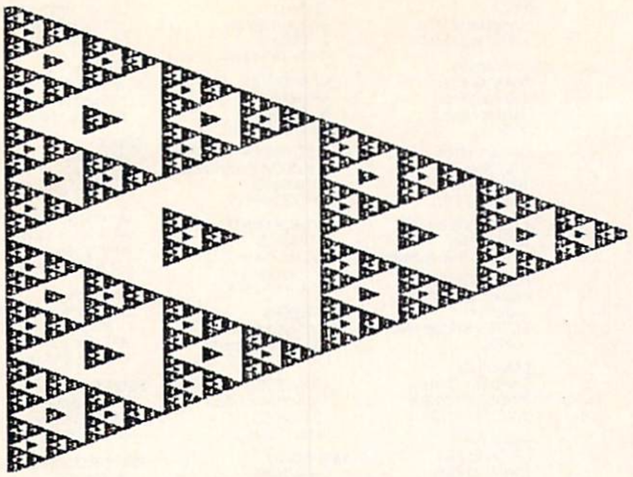


FIGURE 1: TRIANGLES

ing at line 460 is repeated.

If the space bar is pressed, line 640 clears the graphics screen and branches to line 380 where the window constants are recalculated according to the current minimum and maximum coordinates found so far. The image is then begun again but at a smaller scale.

Replace the 1000 in line 20 with 2000 through 7000 in turn to generate the different images. Next we will discuss how to represent other images in this compressed format. Then you can add your own DATA statements to the program.

COLLAGES AND TRANSFORMATIONS

We will now look at the procedure which allows us to convert an image of 64,000 pixels into a handful of transformation coefficients. Calculating the transformation coefficients is somewhat more difficult than running the program above to generate the images, but it is definitely manageable. Although there is a significant amount of mathematical theory supporting the process, all we need is the ability to make a collage.

(Note: Collage is an art form in which the image is composed of smaller pieces or objects typically glued to the paper, overlapping one another. We all made autumn leaf collages in kindergarten, didn't we?)

First, find an image which is a suitable candidate to be compressed. The best images are like those presented in the DATA statements of the *Fractal Decoder* program and shown in Figures 1-5.

They may be very complicated images, but more important, they can be approximated by overlaying smaller, similar images (hence the collage concept). We will work an example to show how this is done.

Consider the large triangle shown in Figure 6. Clearly it can be exactly covered by the four smaller, similar triangles I-IV. Three of the small triangles (I-III) have the same orientation (pointing to the right) as the original, and the fourth triangle has been flipped over to point left.

These four triangles correspond to four transformations of the original triangle. A transformation consists of changes in size (called scaling), location (translation), and/or orientation (rotation). By performing one or more of these three operations, we "transform" the original triangle into one of the smaller ones.

Once we have figured out how to make a collage of transformed triangles to closely overlap the original image, we must calculate six numbers which define each transformation. We will calculate these coefficients for one transformation at a time.

The program *Solver* (see page 70) does the mathematical dirty work to calculate the transformation coefficients. It is based upon a program in the book *Numerical Methods for the Personal Computer* by Terry Shoup (Prentice-Hall, 1983). The program solves six simultaneous equations for six variables A-F. We must supply X and Y values for any three points in the original image and the corresponding three sets of X and Y values of the transformed image.

We have arbitrarily defined the height (Y direction) of the original triangle in Figure 6 to be 4 units and the width (X direction) to be 2 units. Any scale will do. The three points L, M, and N correspond to the three vertices (going counter-clockwise) of the original triangle. In triangle I, the corresponding points are identified as L' (read L-prime), M', and N'.

The X and Y coordinates of these six points are fed into *Solver*, which calculates the transformation coefficients for triangle I. This table summarizes all X,Y coordinates for corresponding sets of points in the original and the four transformed triangles.

Point	Original	I	II	III	IV
L	0,0	0,0	1,1	0,2	1,3
M	2,2	1,1	2,2	1,3	0,2
N	0,4	0,2	1,3	0,4	1,1

Notice that for triangle IV, it is assumed that the original triangle was shrunk and then rotated 180 degrees about its center point. Consequently the lower left corner L of the original triangle is at the upper right corner of triangle IV.

(Note: We could also have assumed that the original triangle was just flipped right to left so that its lower left corner is now the lower right corner of triangle IV. Because of symmetry in this example, the resulting images would be the same even if the transformations were different.)

The DATA statements beginning at line 40 of *Solver* store pairs of coordinates for the original image and one of the transformed images. As shown in the listing, the three points of the original triangle are in lines 40, 42, and 44. The corresponding points of triangle I are in lines 41, 43, and 45. When you run the program, the transformation coefficients A-F are calculated to be

A	B	C	D	E	F
.5	0	0	.5	0	0

A and D tell how much the triangle was shrunk (scaled) in the X and Y directions respectively. The B and C values are related to amount of rotation of the transformed image. E and F tell how much the new image is shifted or translated in the X and Y directions from the original.

From these transformation coefficients, we can see that

triangle I is the result of shrinking the original to half its initial size in the X and Y directions (A=D=0.5). It is not rotated (B=C=0), and it is not translated (E=F=0) since its lower left corner coincides with the original.

Now put the data for triangle II into lines 41, 43, and 45 and run the program again. The transformation coefficients A-F for this triangle are 0.5, 0, 0, 0.5, 1, 1. The values of E and F tell that this triangle is shifted 1 unit to the right and 1 unit up from the original triangle. This is seen by comparing their lower left corners.

Replacing the data in lines 41, 43, and 45 with values for triangle III and then again for triangle IV gives the following set of transformation coefficients for the four triangles:

Triangle	Coefficients					
	A	B	C	D	E	F
I	0.5,	0,	0,	0.5,	0,	0
II	0.5,	0,	0,	0.5,	1,	1
III	0.5,	0,	0,	0.5,	0,	2
IV	−0.5,	0,	0,	−0.5,	1,	3

Notice that the transformation for triangle IV has negative scaling factors. These correspond to flipping the image in the X direction and then in the Y direction (as well as shrinking it by 0.5). Can you see why E and F are 1 and 3 for triangle IV?

Each transformation must be given a probability factor for use in the *Fractal Decoder* program. This factor must be between 0 and 1. The sum of the probabilities should be 1.00. One way to pick these probability factors is to use the ratios of the areas of the transformed images. Since all four of our triangles are the same size, we can give them equal probabilities of 0.25.

Now we are ready to try this data in *Fractal Decoder* to see if it does generate the image of a triangle. Change line 20 to RESTORE 8000. Then add these lines:

```
8000 DATA 4
8010 DATA 0.5, 0, 0, 0.5, 0, 0, 0.25
8020 DATA 0.5, 0, 0, 0.5, 1, 1, 0.25
8030 DATA 0.5, 0, 0, 0.5, 0, 2, 0.25
8040 DATA-0.5, 0, 0,-0.5, 1, 3, 0.25
```

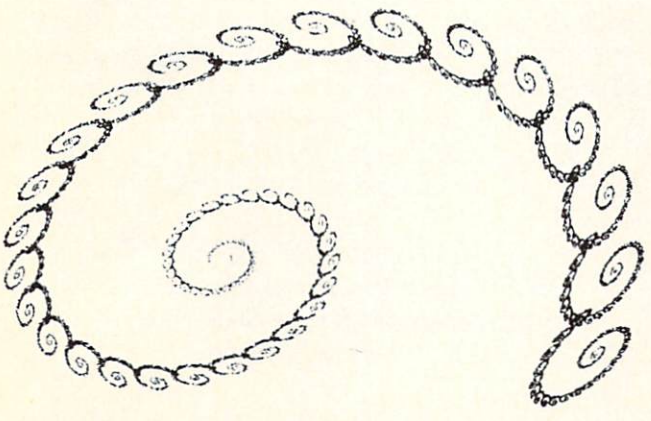


FIGURE 2: SPIRALS

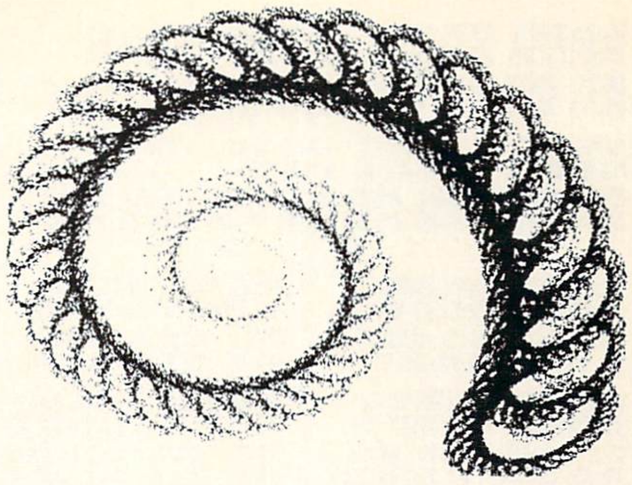


FIGURE 3: FOSSIL SNAIL

The first data value identifies the number of transformations. The next four lines contain the transformation coefficients A-F and the probability for each.

ON YOUR OWN

You can make triangle IV appear "lighter" with fewer points by reducing its probability. Change the last values in lines 8010-8040 to 0.3, 0,3, 0.3, and 0.1. In this case the points in triangle IV will be chosen one-third as often as in any of the other triangles.

Now that you know the procedure for calculating transformation coefficients and have some feeling for the meanings of the individual coefficients, let the experimentation begin.

Try "moving" triangle II a little further to the right and see how that affects the whole picture. Recall that the E coefficient defines the amount of X translation. Change the value of E in line 8020 from 1 to 2 and see what happens. Instead of creating a solid image, these transformations define an unexpectedly complex image with an intricate, symmetric hole structure.

Whenever the original image is not exactly overlaid by its transformed images, those transformations will not exactly recreate the original image. For example, the seven transformations starting in line 6000 of *Fractal Decoder* represent my attempt to encode a circle. I overlaid the original circle with seven smaller circles, one at the center and six around the central one.

The resulting decoded image is not a circle. It is a ring of six hexagons around a central hexagon. The decoded result is a close approximation to a circle because my collage was only a close approximation.

Keep in mind that this image compression technique is most useful for images which are fractal in nature. These are images that are complex with some self-similarity at any level of magnification. Ordinary geometric objects such as lines, angles, and smooth curves are better-represented by algebraic expressions or by a few points than by this fractal compression method.

It takes only four numbers (the X and Y values of its two endpoints) to define all the points on a straight line. Trying to define the image of a fern or a cloud or the bark



FIGURE 4: SQUARES

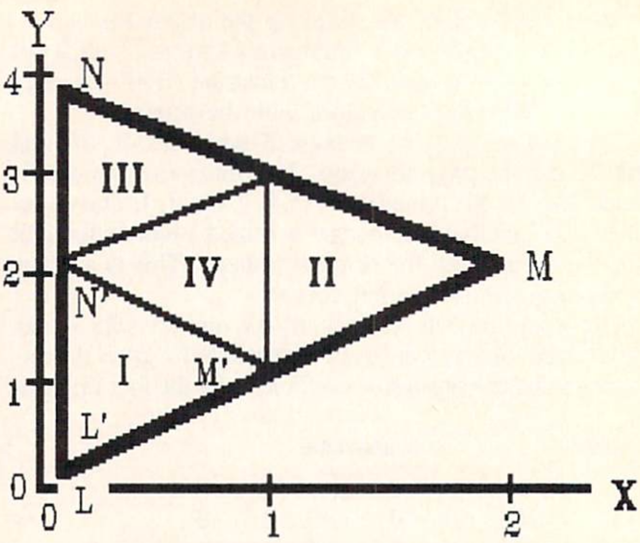


FIGURE 6: TRIANGLE EXAMPLE

of a tree in terms of straight lines would be futile. This fractal technique succinctly defines the image of a fern with only 28 numbers. The more-complex images are more suitable for this type of image compression.

You can modify *Fractal Decoder* so that it plots the points from each transformation in a different color. The value of J tells which transformation has been randomly chosen for the next point. Use J to pick the color of that point. This way you can easily see the role of each of the transformations in creating the image. For example, with a different color for each transformation, you will see that the transformation for the fern in line 7040 generates a small portion of the stem at the bottom of the image.

You will probably want to speed this program up as much as possible: compile it, remove the comments, compress it, and so forth. The automatic window scaling routine takes a fair amount of time. Once you know the XA, XB, YC, and YD values for a given image, you can put them into DATA statements along with the transformations. Just read them in and use them rather than executing the initialization routine and checking for the minimum and maximum X and Y values.

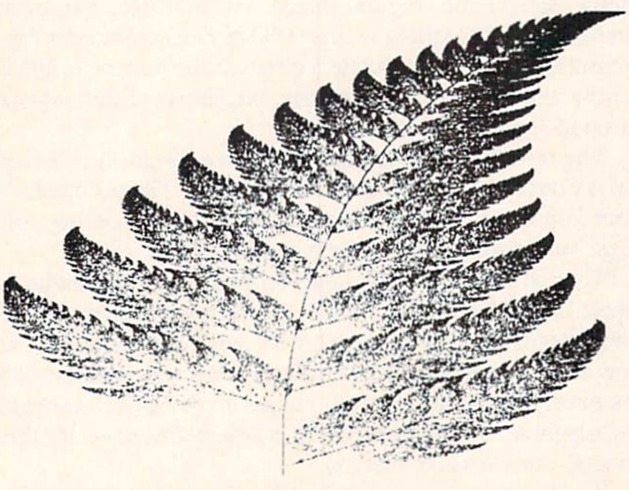


FIGURE 5: FERN

Another possibility is that you might convert this program so that it works on the C-128's 640 by 200 pixel RGB screen. Figures 1-5 were generated on a 640 by 350 pixel screen. Many images in the book referenced at the beginning of this article were produced on 1024 by 1024 (or better) graphics screens.

See what other images you can create either by starting from scratch as we did with the triangle or by tweaking the various parameters of the transformations already given. It takes some playing around to get a feeling for all of this. Use your printer screen dump routine to make printouts of your creations. I am interested in hearing your comments and in seeing your best results. ☐

SEE PROGRAM LISTINGS ON PAGE 69

128 BASIC SCROLLER

Pass the Point of No Return in Program Editing

By Shawn K. Smith

128 BASIC Scroller makes listing through a BASIC program sinfully easy.

THE HEADACHE

With the Commodore 128's powerful screen editor, entering lines of BASIC code is very straightforward, especially compared to some other editors which I will not mention here. Unfortunately, however, the machine fares rather poorly when it comes to examining a program listing which extends beyond the visible window.

You know what I'm talking about: You load one of those extremely long programs that you're working on, type LIST, and naturally, the first couple of lines scroll by too fast for examination. With panic, RUN STOP is pressed and the lines are listed again. And this tedious process of LISTing a few lines, pressing RUN STOP, examining, and LISTing a few more is continued because it happens to be the best the machine initially offers.

EXCEDRIN

Now with *128 BASIC Scroller*, examining a BASIC listing is as easy as positioning the cursor on the left top or bottom edge of the screen and pressing the Cursor Up/Down key. When this is done, the utility checks the entire screen, beginning at the current cursor location, searching for a logical line that begins with a possible line number. If a number turns out to be a valid line number, the next line in the BASIC program is listed. If the Cursor Up caused the action, the next lowest number is listed, unless the line happens to already be the lowest, in which case the last line of the program is listed. Likewise, the Cursor Down causes the next highest line to be listed, cycling back to the first line if necessary.

FINAL DIAGNOSIS

Take the time to save a copy of *128 BASIC Scroller* before running it. The BASIC loader includes the necessary code to make it relocatable. Change the variable S to any other convenient starting address that you wish.

The program does contain one harmless idiosyncracy which you should be aware of. When the Cursor Up key is pressed at the leftmost top edge of the screen, and the first possible line number turns out to be invalid, the Cursor will relocate itself on that number. Pressing the HOME key will fix things if this happens.

I'm confident that *128 BASIC Scroller* will make examining and working with your Commodore 128 more productive. □ *SEE PROGRAM LISTING ON PAGE 66*

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FLAG HUNT

For the C-64

By John Fedor

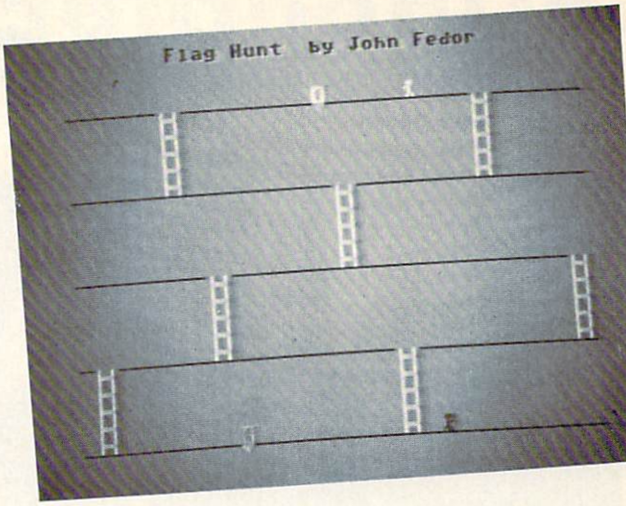


PHOTO: MICHAEL R. DAVILA

Dodging your enemy's fire while trying to quickly snatch the flag and return it to base is your main objective in *Flag Hunt.* Unfortunately, it isn't quite so easy. Besides dodging the bullets (they move quite fast), you must avoid hand-to-hand combat with your opponent. If you run into either your opponent or a bullet, you lose possession of the flag and are automatically returned to base. To shoot a bullet, press the fire button and move the joystick in the direction you wish to shoot. You must release the fire button before another shot can be taken.

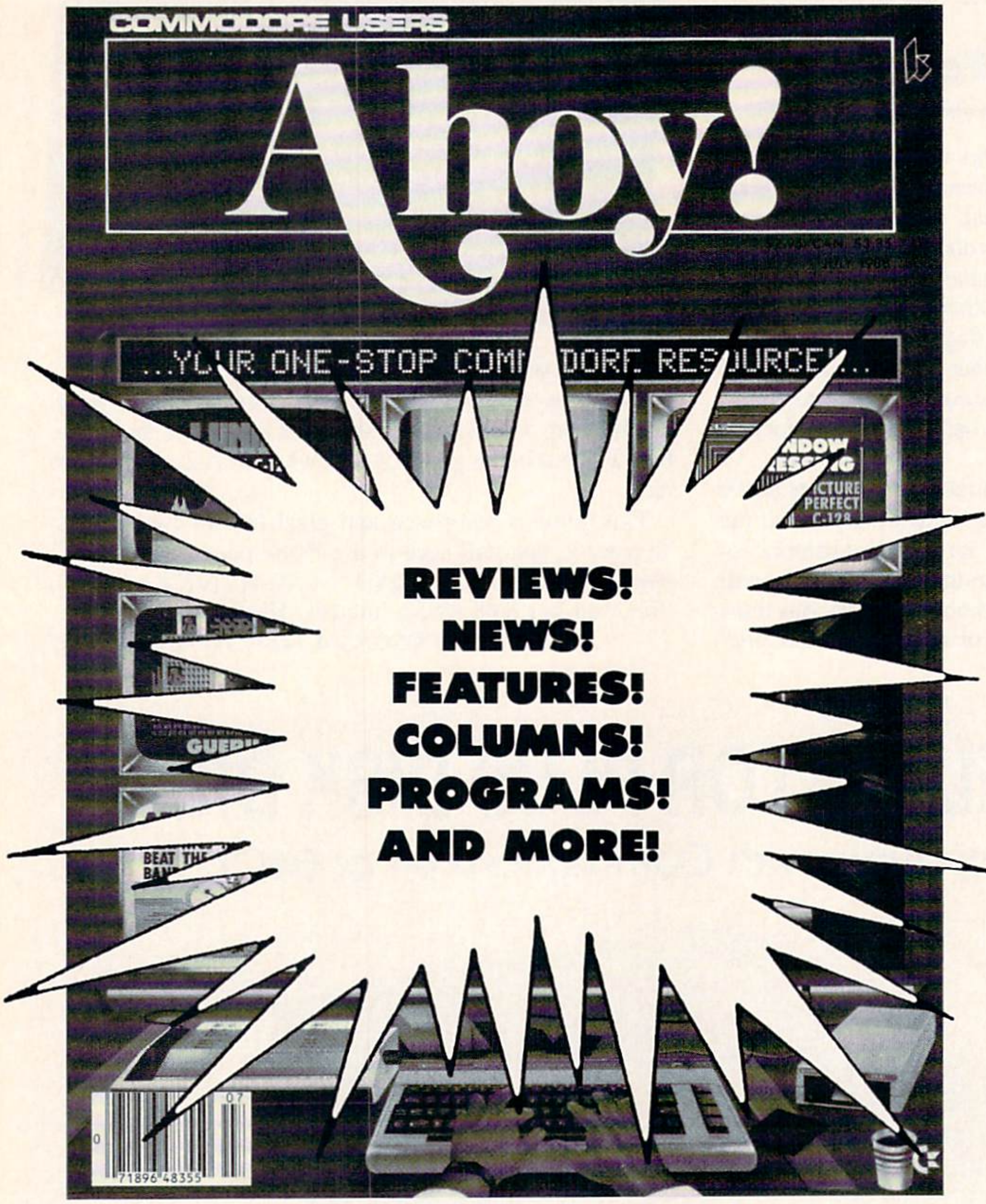
The flag (the flashing F) you want to get appears above your opponent's base (the flashing triangle). By use of the ladders, make your move towards the flag. You must be totally on top of the base to receive the flag. The flag will disappear when you have possession, and then you must return to your base. Getting shot or running into the enemy makes you lose the flag, so be careful.

Each player moves at a fast pace, but the bullets travel much faster. The winner is shown at the end of the game. Port 1 controls the green player, while Port 2 controls the red.

This game is fast-paced and great fun for two players. To enter it, you will need to use *Flankspeed* (page 63). To play, you need to type LOAD "FLAG HUNT",8,1 (return) (followed by) SYS 49152 (return). Have fun. □

SEE PROGRAM LISTING ON PAGE 67

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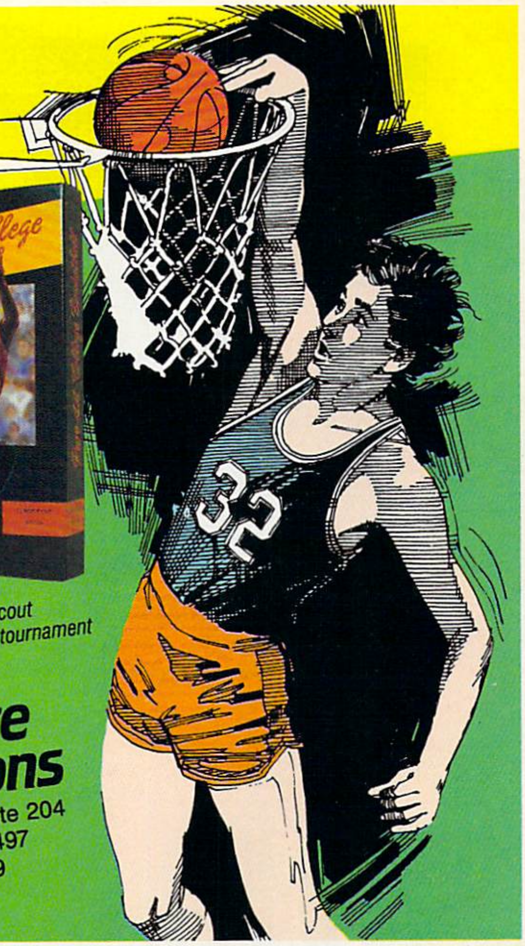
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Pure-stat College Basketball





Authorities say that coaching ability makes the difference in college basketball: Can you coach a team to the final 4, or even the National Tournament? Now you can find out! From the authors of PURE-STAT BASEBALL comes PURE-STAT COLLEGE BASKETBALL.

This statistically based program contains 20 great college teams from the past and present. See all the plays animated on the screen with 5 on 5 full court action. Everything from a slam dunk to a fast break. Special features include: Man-to-Man or Zone defenses, the option to SLOW-DOWN the tempo of the game (allowing a weaker team to be competitive with a stronger one), or take a 3 point shot with current teams, fatigue factors are included for each player based on time played.

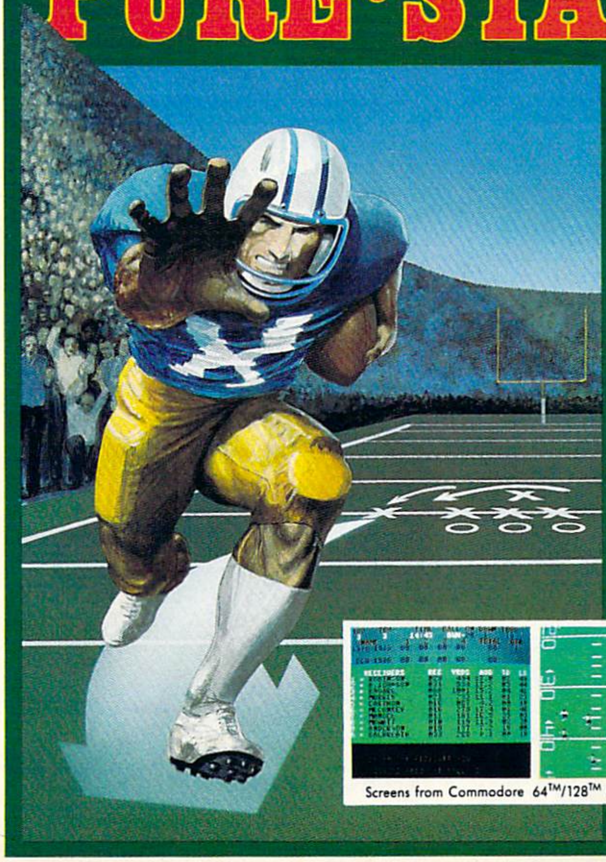
In PURE-STAT COLLEGE BASKETBALL you can play against an opponent, play against the computer, or let the computer play itself (great for tournament play). This program also includes a stat compiler which saves the results of the games played. This feature allows you to scout the opposition or evaluate your own team. If you feel you're up to the challenge, set up your own tournament and test your coaching skills. Will your team make it to the final 4?

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The authors of **Pure-Stat Baseball** and **Pure-Stat College Basketball** introduce their most precise simulation to date, **PURE-STAT FOOTBALL! This third generation** football game has a wide array of innovative features that include: Computer Coaching using artificial intelligence to select offensive/defensive plays, Vertical and Horizontal Scrolling of on-field action, a built-in Stat Compiler, and much more. PURE-STAT FOOTBALL will challenge even the most avid fan!

- For zero, one, or two players
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Screens from Commodore 64™/128™ version of game.

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Skate or Die's *selection as 1988 Game of the Year reflects the industry's new emphasis on action contests.*

THE BEST

Finest Funware for the

By Arnie Katz and

There certainly was no shortage of new Commodore 64 games in 1988, primarily due to a strong influx of titles from Great Britain and continental Europe. Many of these were run-of-the-mill programs, but some of the imports are equal to the best of the creations of domestic designers.

It would have been a much duller year without the European connection. As eventually happens to all systems in the changing world of home computing, the Commodore 64 has slipped from its position on the cutting edge of American software development. Virtually all entertainment programs were developed on the Commodore 64 as recently as 1986.

Today, most games produced in the United States are developed on MS-DOS and Amiga computers. Skilled programmers then translate the original design into C-64-compatible code. Games which *are* developed on the Commodore are often aimed as much at the UK as at the US.

This has important effects on entertainment software published in this country:

• Fewer new games make their de-



Coordinating the efforts of several teenagers to save their friend trapped in the **Maniac Mansion** *results in a kind of interactive kid adventure movie.*



Test Drive *is one of the few computer racing simulations in which finishing is not as simple as putting the pedal to the metal and zooming through at top speed.*



Speed Buggy: *enjoy the thrills and spills of off-road racing onscreen.*

YEAR'S ENTERTAINMENT

of 1988 Commodore 64

the Editors of *Ahoy!*

but on the Commodore 64.

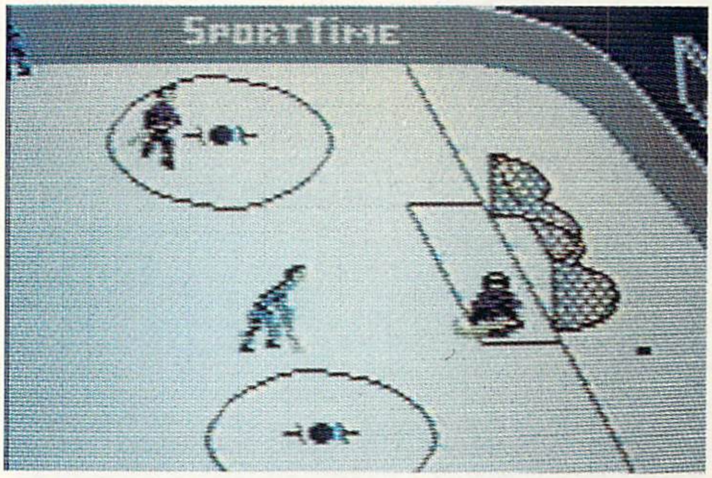
• Fewer new games maximize the power of the Commodore 64.

• Most C-64 games are designed to work on European tape-based systems.

Despite these negative factors, Commodore games are truly better than ever. Designers, illustrators, and programmers have all become more conversant with the capabilities of the system and, consequently, better utilize its power.

Ahoy! editors examined several hundred games introduced for the Commodore between September 30, 1988 and October 1, 1987. The programs described in this article constitute their choice of the best in a strong field. The judges could have added at least another 30 to 50 titles to the list of winners without sacrificing much quality.

The writers who regularly cover entertainment software for *Ahoy!* have collaborated on this effort to honor the top entertainment products of 1988. The compilers hope that readers whose favorites didn't make this year's list will be charitable about any difference of opinion. Few games are so awful that they are universally unloved, and even fewer are so perfect that they escape



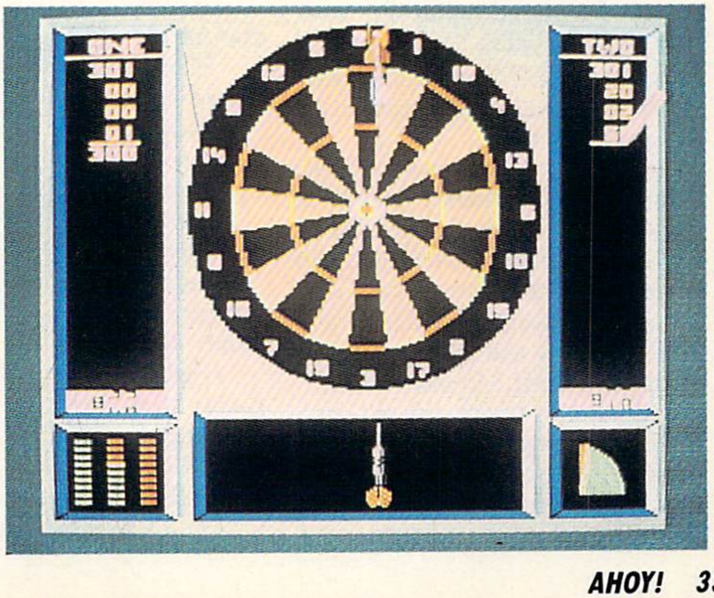
Superstar Ice Hockey's *league play system earns a check. The net result is a chance to interact on many levels.*



The post-nuclear war United States of **Wasteland** *provides an exciting backdrop for expeditions in which the player controls a party of six characters, each endowed with unique abilities.*



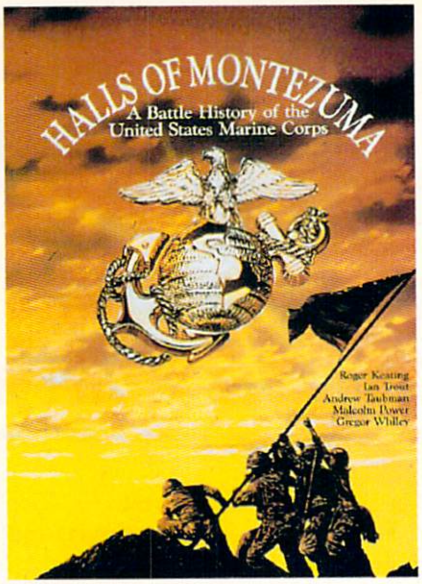
Monopoly *enhances the board game's appearance without changing the rules.*



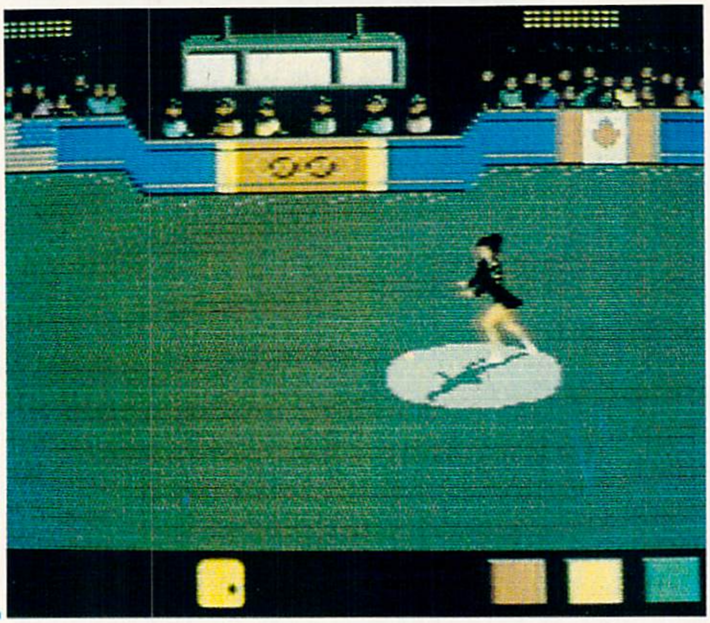
Superstar Indoor Sports *offers four off-beat events: ping pong, bowling, darts, and air hockey. Each is good enough to have been a stand-alone game.*



The Three Stooges *vividly evokes Moe, Larry, and Curly's slapstick comedy via charming action games derived from some of their famous scenes. It is simultaneously fun and funny.*



Halls of Montezuma *superbly reproduces major battles of the U.S. Marines.*

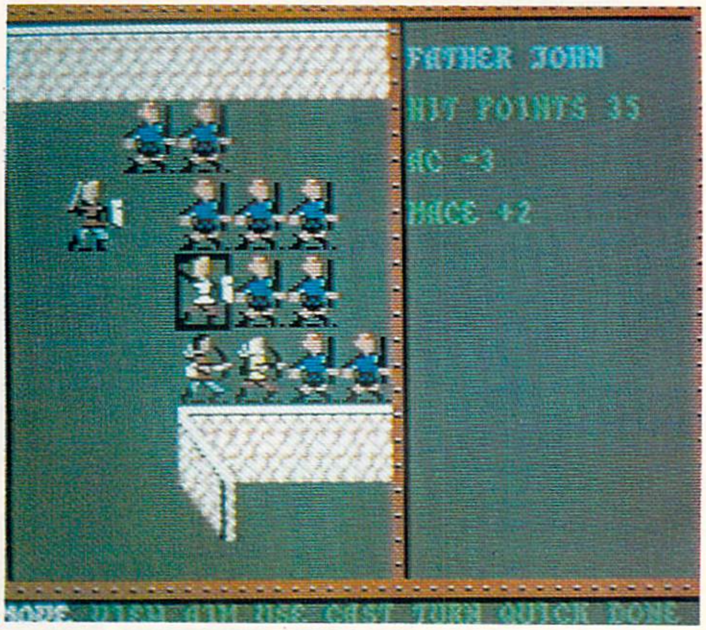


The Games—Winter Edition *features camera-eye views that give the feel of network coverage. Events include slalom, figure skating, cross-country skiing, luge, oval-track speed skating, and ski jump.*

all criticism. Apologies are also due to publishers whose programs arrived too late for consideration this year. They will be eligible for recognition in the "Best of 1989" competition, winners of which will be announced in the January 1990 *Ahoy!*

Games designed by Subway Software (Arnie Katz, Bill Kunkel, and Joyce Worley) are automatically ineligible for consideration. No one should judge his or her own work. However, there is no law against checking out *MicroLeague WWF Wrestling* and the *Superstars of Wrestling* (all MLSA) match disks.

Each category begins with our selection for the best new game of that type, followed by a group of honorable mentions. The envelopes are stacked on the podium. Now, to the winners.



The sophisticated scenario of **Pool of Radiance,** *based on a printed module for Advanced Dungeons & Dragons, separates it from the many other excellent games of its type published during 1988.*

Game of the Year

The choice of *Skate or Die* (Electronic Arts) as Commodore 1988 Game of the Year symbolizes a major shift in game design. The previous two winners, *Elite* (Rainbird) and *Shanghai* (Activision), were both strategy contests that challenged brain cells more than reflexes. *Skate or Die* is uncompromising arcade-style action, embellished with the best audiovisual effects found on any Commodore 64 program.

The pendulum is swinging away from cerebral software to boot and bash disks. There are three main reasons for this change:

1. The renewed popularity of video

games clearly demonstrated to computer software makers that the public is no longer bored with action-oriented software.

2. Commodore disks compete with Nintendo and Sega cartridges for shelf space in discount stores. Hot joystick contests are a good way to lure video gamers into the computer audience.

3. The British market voraciously gobbles action games. This has created a reservoir of hundreds of titles for any American publisher that wants to put together a line of C-64 leisureware.

Sports

This year's top sports game combines elements of both action and statistical simulations. Ed Ringler's *Superstar Ice Hockey* (Mindscape) lets the computerist interact at a variety of levels. It is possible to coach from the sidelines or directly control the skaters on the ice.

A game of *Superstar Ice Hockey* is fun, but the program's system of league play delivers the maximum entertainment punch. The player must succeed as general manager, coach, and player to turn a franchise into a dynasty.

Pure-Stat Football (Software Simulations), *John Elway's Quarterback* (Melbourne House), and *4th and Inches* (Accolade) have turned a weakness in the Commodore software library into a strength. Football fanatics haven't had many choices, but these three titles are Super Bowl quality.

Pure-Stat Football (Software Simulations), by the same group which created *Super Bowl Sunday* (Avalon Hill), is the best football statistical simulation available for any home computer. The solitaire mode is especially good, because the computerized coach adjusts to the gamer's play selection strategy during the course of the game.

The other two pigskin programs are more action-oriented. *John Elway's Quarterback* is a faithful home translation of a popular 1987 coin-op. *4th & Inches*, by veteran designer Bob Whitehead, makes it easy for players to pick offensive and defensive formations by showing the alternatives right on the playfield screen. This permits the game to include a variety of plays without asking the human participants to memorize a lot of pass routes and blocking assignments.

Epyx, which pioneered Olympic-style sports with *Summer Games*, applies the latest programming and design techniques to 1988's *The Games*. This multievent action-strategy program is packed with cold weather athletic action amid the pageantry of the Winter Olympics.

Superstar Indoor Sports (Mindscape) comes from the same Ed Ringler-led design team as *Superstar Ice Hockey*. It offers four off-beat events: ping pong, bowling, darts, and air hockey. Each of these contests is good enough to stand alone, but together they make *Superstar Indoor Sports* and outstanding software bargain.

Action

Constantly complaining commuters have finally gotten a game which celebrates their ordeal. *Metrocross* (Epyx) is a madcap race against time in which the onscreen character leaps barriers, dodges rolling cans, and rides skateboards to get to his destination.

Blockbuster (Mindscape) adds some new wrinkles to the classic wall-bashing game in which players try to clear playfields one brick at a time. The main innovation is that the player can convert tokens, earned by destroying key bricks, into extra powers. A playfield construction module gives computerists the chance to concoct their own *Blockbuster* challenges.

Bubble Ghost (Accolade) rewards accuracy, not speed. The player blows puffs of air to gently guide a fragile bubble around sharp spikes, lit candles, and similar perils. The Infogrames design group, also known for the splashy *Captain Blood* on the Amiga, combines simple, well-drawn visual elements into a wide variety of engaging puzzles.

Speed Buggy (Datasoft) and *4x4* (Epyx) give computerists the chance to vicariously experience the thrills of off-road racing. Although the games depict the situation somewhat differently from each other, both are fast-paced and reasonably challenging. *Speed Buggy* stresses high speed driving over tortuously curving roads, while *4x4* emphasizes road hazards like rocks and fences.

Action Strategy

Strategy games built on simple, joystick-driven interfaces show no decline in popularity. They have the excitement of action games, plus the additional mental challenge once found only in the standard strategy contests.

The Three Stooges (Cinemaware) is a computerized board game with the flair players expect from Bob and Phyllis Jacob's design and development taskforce. It vividly evokes the Three Stooges' slapstick comedy through its charming action games derived from some of their most famous scenes.

The computerist directs the efforts of Larry, Moe, and Curly to raise enough money to save an orphanage from foreclosure. The only way the boys can earn money for this worthy cause is to take jobs, each represented by an action game.

The Three Stooges has lots of physical comedy, and the characters exude



The Lipstik controller included with **Echelon** *adds a play element not found in any previous flight simulator: the capability of shouting commands at other crew members.*

their familiar celluloid personalities. *The Three Stooges* is a rarity among entertainment software products; it's a game that is both fun and funny.

The President Is Missing (Cosmi) makes the user interface more transparent, heightening the player's involvement. The action in the game parallels what the computerist is actually doing in the real world. In *The President Is Missing*, the player must save the nation's chief executive by using the computer console to correlate information and unravel the mystery.

It's hard to keep a bad man down, and Elvin Atombanger of the original *Impossible Mission* (Epyx) is one of the worst villains in computer gaming. The sequel, *Impossible Mission 2* (Epyx), merits an honorable mention for bringing Elvin back, more formidable than ever! There's plenty of climbing and jumping action as the player tries to arrest the megalomaniac in his central tower.

BattleDroidz (Datasoft) combines the tricky maneuvering of games like 1987's *Marble Madness* (Electronic Arts) with the excitement of an action combat contest. The three-robot warrior team patrols over the digital landscape on a mission to conquer warzones and kill the enemy Cyberites.

Strategy

The recent success of action games doesn't mean that publishers have neglected fans of brain games. There weren't as many new strategy contests as in previous years, but the top titles compare favorably with the all-time bests.

Monopoly (Leisure Genius) is not the first attempt to put the world's most popular board game onto a computer screen, but it is surely the most satisfying. The British design team has done a marvelous job of enhancing the appearance of the real estate game without altering the traditional rules.

The two honorable mentions continue the international motif started with the winner. *Soko-Ban* and *Tetris* (both Spectrum Holobyte) were conceived on foreign shores.

Tetris is the first game conceived in the U.S.S.R. to reach the United States. The mathematical simplicity of juggling little shapes to fill each row of the rectangular playfield is entrancing. *Tetris* may be the most addictive strategic game since *Shanghai*.



The President Is Missing! ***makes the user interface more transparent, as the action in the game parallels what the user is doing in the real world. Clues are provided on a 30-minute audio cassette and in simulated C.I.A. data banks. The computer is used to correlate the info and solve the mystery.***

The Japanese design team for *Soko-Ban* turns running a warehouse into a series of topological puzzles. The player transfers cartons to the holding area in the fewest possible moves. The player only has the strength to push one box at a time, so it takes a lot of careful arranging in order to get them all to the destination.

Military Strategy

The year's best war game is the product of Australia's most famous design team, Ian Trout and Roger Keating. Their *Rommel* (Strategic Studies Group) is a complete simulation of the North African campaign of World War II for experienced armchair military strategists.

It's easy to pour on the special rules and extra factors in a wargame, but it is much harder to fully simulate a situation in a playable structure. That's the genius of *Rommel*. It is as accurate and exhaustive as any non-electronic multimap war game, but is no harder to grasp than the typical introductory military simulation.

The user interface organizes the turn sequence and presents the decision points to the computerist in logical order. *Rommel* is intellectually taxing, but it is not frustrating.

The design duo from Down Under had two honorable mentions in 1987, and cops another this year for *Halls of Montezuma* (SSG). It employs a version of the same basic play-system used in *Rommel* to reproduce major battles involving the United States Marines. It has so many of the virtues of *Rommel* that the judges practically flipped a coin to see which one should head the list.

Panzer Strike (Strategic Simulations) is an advanced tactical simulation of World War II armored combat. The computerist can restage actual battles, wage an entire campaign, or construct hypothetical scenarios. Gary Grigsby's tribute to tanks is so detailed that each unit depicted on the playfield represents one armored fighting vehicle.

Tobruk (Datasoft) shows that there is more than one way to simulate a battle. Steven R. Williams presents a joystick-activated wargame based on the most famous battle of the same WW II campaign which inspired *Rommel*. Unlike Trout and Keating's masterpiece, this graphics-intensive strategy

contest would be a perfect introduction to wargaming. It sacrifices some detail, of course, but only to make it suitable for the casual computer gamer.

Wooden Ships & Iron Men (Avalon Hill) and *High Seas* (Garde Games) both simulate naval warfare during the age of Fighting Sail. The former title is based on the classic board game, while the latter capitalizes on the graphic capabilities of the computer. *High Seas* is especially appealing to those who don't normally have the patience for war games, because it is streamlined, playable, and pretty. *Wooden Ships & Iron Men* is less flashy, but investigates the subject in greater depth.

Simulators

The designer of the year's best simulator, Distinctive Software, is aptly named. After hundreds of "me, too" auto race games, *Test Drive* (Accolade) stands out like a new Corvette at a demolition derby. Its first-person view includes the instrument panel as well as the rugged mountain road ahead. The computerist actually sees the driver's hand move the stick from position to position when shifting gears.

Test Drive is one of the few computer racing games in which an arcade ace can't just put the pedal to the metal and zoom through the whole course at top speed. Getting to the top of The Rock in *Test Drive* really does make the player "King of the mountain."

The Lipstik controller which is packaged with *Echelon* (Access Software) adds a dimension not found in any previous flight simulator. For the first time, the armchair pilot can actually shout commands at the other crew members during the outer space battle action.

Sid Meier and Arnold Hendrick, the authors of *Red Storm Rising* (MicroProse), use Tom Clancy's novel of the same name as the background for a minutely detailed submarine combat simulator. The striking graphics, MicroProse's best ever, and slick Commodore programming by Silas *(Castle Wolfenstein)* Warner makes *Red Storm Rising* the better of the two recent attempts to transform Tom Clancy novels into computer games. (See review in this issue).

If Bruce Artwick's *Flight Simulator II* (SubLOGIC) doesn't have enough action, try the eight combat scenarios in *Stealth Mission* (SubLOGIC). Steve Setzler, under the direction of the inimitable Artwick, designed this flawlessly animated first-person simulation of modern air warfare.

Adventures

Adventures remain one of the most popular types of computer games, but the category has changed a lot since *Ahoy!* first began compiling these annual surveys of outstanding recreational software. Almost all the adventures marketed in 1986 were either prose or illustrated quests. However, neither this year's winner nor the three honorable mentions fall into either subclass.

Wasteland (Electronic Arts) proves that the interplay group can handle science fiction as well as fantasy. The post-nuclear war United States provides an exciting backdrop for expeditions in which the player controls a party of six characters, each with unique abilities.

Beautiful color graphics in first-person perspective enliven the questing in *Might & Magic* (New World Computing). Jon Van Caneghan's design builds on the conventions of fantasy role playing games with intelligence and skill.

Advanced Dungeons & Dragons: Pool of Radiance (Strategic Simulations) finally brought and authorized version of "Dungeons & Dragons" to the computer gaming screen. Its sophisticated scenario, based on a printed module for "Advanced Dungeons & Dragons," and tactical combat system separate it from other excellent games of this type published in 1988.

The joystick-activated interface of *Maniac Mansion* (Lucasfilm) plunges the computerist into an interactive kid adventure movie like "Young Sherlock Holmes," "Monster Squad" or "Goonies." The player must get the cast of teenagers to work together to rescue a friend from the mysterious house.

Summing Up

What will next year's best be like? It is risky to speculate so early in the year, but publishers' announced plans provide clues.

The total number of new games will dip again, though there is no reason to expect a shortage of fresh software. Action and action-strategy games, followed closely by sports, are likely to comprise the largest portion of the output. An upswing in games tied to major licenses is also in the cards for 1989.

And with any luck at all, we'll be back at this time next year to extol the virtues of another outstanding group of games for the Commodore. ☐

For further information on any of the games mentioned in this article, contact the appropriate companies:

Access Software
545 W. 550 So., Ste. 130
Bountiful, UT 84010
Phone: 801-298-9077

Accolade
20813 Stevens Creek Blvd.
Cupertino, CA 95014
Phone: 408-446-5757

Avalon Hill
4517 Harford Road
Baltimore, MD 21214
Phone: 301-254-9200

Cinemaware Corporation
4165 Thousand Oaks Blvd.
Westlake Village, CA 91362
Phone: 805-495-6515

Cosmi
415 North Figueroa Street
Wilmington, CA 90744
Phone: 714-240-8985

Datasoft
19808 Nordhoff Place
Chatsworth, CA 91311
Phone: 818-886-5922

Electronic Arts
1820 Gateway Drive
San Mateo, CA 94404
Phone: 415-571-7171

Epyx, Inc.
600 Galveston Drive
P.O. Box 8020
Redwood City, CA 94063

Garde Games
8 Bishop Lane
Madison, CT 94063

Leisure Genius
c/o **Electronic Arts**

Lucasfilm Games
P.O. Box 2009
San Rafael, CA 94912
Phone: 415-662-1966

Melbourne House
711 West 17th Street, #G9
Costa Mesa, CA 92627
Phone: 714-631-1001

MicroProse
180 Lakefront Drive
Hunt Valley, MD 21030
Phone: 301-771-1151

Mindscape
3444 Dundee Road
Northbrook, IL 60062
Phone: 312-480-7667

New World Computing
14922 Calvert Street
Van Nuys, CA 91411
Phone: 818-785-0519

Software Simulations
959 Main Street, Ste. 204
Stratford, CT 06497
Phone: 203-377-4339

Spectrum HoloByte
2061 Challenger Drive
Alameda, CA 94501
Phone: 415-522-3584

Strategic Simulations
1046 N. Rengstorff Ave.
Mountain View, CA 94043
Phone: 415-964-1353

Strategic Studies Group
1747 Orleans Court
Walnut Creek, CA 94598
Phone: 415-932-3019

SubLOGIC Corporation
501 Kenyon Road
Champaign, IL 61820
Phone: 217-359-8482

TIPS AHOY!

Compiled by Michael R. Davila

Contributors to *Tips Ahoy!* will be compensated at competitive industry rates. Send your best programming and hardware hints for the C-64, C-128, or Amiga (send longer routines on disk, please) to *Tips Ahoy!*, 45 West 34th Street—Suite 500, New York, NY 10001. Include a stamped and self-addressed return envelope if you want your submission returned.

DISK ID CHECKLIST

If you have more than a few disks and do not keep a record of their ID's, you may find that you have duplicate ID's on some of them. The following short program will print a checklist of 360 number and letter-number combinations suitable for use as disk ID's. Although this does not represent all possible ID combinations, it will be enough for all but the most incorrigible packrats.

Print a copy and keep it near your computer. When you format a new disk, select an ID from the checklist and circle it so you know not to use it again.

Once a disk has been formatted, it is impossible by ordinary means to change the ID except by reformatting (and thus erasing the disk). Changing the ID in the disk header does not help. When the disk was formatted, the ID was written to the header block of every sector on the disk. These sector header blocks are never rewritten. These are the ID characters the DOS looks at when deciding whether to copy the BAM.

You can lose data if you have two disks with the same ID. For example, if after working with one disk you place another with the same ID in the drive, the DOS thinks it is the same disk and does not read the BAM. If a save is then made to the second disk, existing data may be overwritten.

—Leo Brenneman
Erie, PA

```
•10 REM * DISK ID CHECLIST *
•20 INPUT"SCREEN OR PRINTER S/P";SP$:D=4:
 IF SP$="S" THEN D=3
•30 OPEN 4,D:N$="0":FORX=0TO9:X$=STR$(X):
 Y$=MID$(X$,2,1):PRINT#4,N$Y$"  ";:NEXT
•40 FOR X=10TO99:PRINT#4,SPC(0)X;:NEXT:PR
 INTCHR$(13):N=65
•50 FORX=0TO9:X$=STR$(X):Y$=MID$(X$,2,1):
 PRINT#4,TAB(1)CHR$(N)Y$"  ";
•60 IFN=90ANDX=9THENPRINT#4:CLOSE4:END
•70 NEXT:N=N+1:GOTO50
```

COLOR LIST

Here is a small routine I'm sure you will enjoy. It adds color to a listing.

How it works: When a line starts with a REM statement with at least one character, this routine changes the first character of the REM statement to ASCII for red, green, blue, or white, producing a multicolored listing.

I'm a believer in structured programming. I break my large program into small manageable subroutines. I use REM statements as headers for these routines. When I debug a program I search for the REM header for the program routine as the listing scrolls by. Finding the header can be a difficult task. This program colors the REM statements alternating colors, making the search easy.

BASIC interprets the ASCII number of most colors as key word tokens (unless they are in quotes), making them unavailable to color a listing. The exceptions: red, green, blue, and white are completely ignored. This means a colorized REM statement will revert back to the current cursor color if it is reentered. However, the color is SAVEd and LOADed with the rest of the program.

Directions to color a program:

1. Type in routine with the REM statements.
2. SAVE routine.
3. Run and list routine. The routine should list in red, green, blue, and white. If not, correct and go to step 2.
4. Load program to be colorized.
5. Place cursor next to line 62000 and press RETURN until all lines of the routine are entered.
6. RUN 62000.

Your program now lists in color.

A mistake in entering this routine has the potential to trash a program. It should first be tested on itself.

This program demonstrates all four possible colors. In my personal version of the program I use only red and green (ASCII 28 and 30). I find this combination easiest on the eyes. I changed line 62020 to

```
62020 LP=PEEK(43)+256*PEEK(44):C(0)=28:C
(1)=30:C(2)=28:C(3)=30:K=0
```

For a C-128 version of the program change line 62020 to

```
62020 LP=PEEK(45)+256*PEEK(46):...
```

—Terrence Paul Stender
Kalamazoo, MI

```
•62000 REM ***** COLOR LIST *****
•62001 REM
•62002 REM ADDS COLOR TO A LISTING
•62009 REM INITIALIZE
•62010 POKE 53280,0:POKE 53281,0
•62020 LP=PEEK(43)+256*PEEK(44):C(0)=28:C
 (1)=30:C(2)=31:C(3)=5:K=0
•62029 REM MAIN LOOP
•62030 NP=PEEK(LP)+256*PEEK(LP+1):IF NP=0
 THEN END
•62040 IF PEEK(LP+4)=143 AND NP-LP>6 THEN
 POKE LP+5,C(KAND3):K=K+1
•62050 LP=NP:GOTO 62030: REM MAIN LOOP
```

Circle #161 on Reader Service Card

DISK ERROR TRAPPING

There are many types of programs that save data in a sequential or relative file on disk. In some of these programs, the program asks the user to input the name the file should have. This can cause problems. When users input the name of the file later to retrieve the data, they may not remember the name correctly, or may mistype it. They may even forget to put the disk containing the file in the drive. In any of these cases, the computer will fail to find the file on the disk.

Most computers would stop at this point and signal an error. The Commodore 64, however, tries to read the data from the nonexistent file. When it does this, the variables that are supposedly being read from the disk actually retain their original values. Usually, these values are zero for numeric variables and an empty string for string variables. The program then continues to execute, and either gives incorrect results or crashes later.

To prevent this, the program should be able to detect when the file was not found and ask the user to input the correct file name. The easiest way to do this is to have the program save a test variable when it saves the data on disk. When it retrieves the data, it can retrieve the test data first. It then checks to make sure that this data has the expected value before reading the rest of the data. The following output and input routines demonstrate the principle.

OUTPUT ROUTINE

```
10 INPUT "Name of file to save data in";
F$
20 OPEN 2,8,2,"@:"+F$+",S,W"
30 PRINT#2,999
40 PRINT#2,X:PRINT#2,Y
50 CLOSE 2
```

INPUT ROUTINE

```
100 INPUT "Name of file to load";F$
110 OPEN 2,8,2,F$+",S,R"
120 T=0:INPUT#2,T:IF T<>999 THEN CLOSE 2
:PRINT"File not found.":GOTO 100
130 INPUT#2,X:INPUT#2,Y
140 CLOSE 2
```

In the save routine (lines 10-50), the number 999 saved on disk in line 30 is the test data. Line 120 makes sure that this data was read correctly from the disk. (Notice that T is set to zero first, in case it was still 999 from the last time a file was read.) If T does not equal 999, the program forces the user to input the correct file name. Of course, the program could go someplace else, like the main menu, if the file was not found. —David Leithauser

New Smyrna Beach, FL

EASY ADDRESS

Viewing the disk directory has always been a convenient way to obtain facts concerning the contents of a disk. Although a reasonable amount of data is featured in the directory, there are still occasions requiring even further information. For example, think of all the times you may have forgotten the starting address of a particular machine language file. Perhaps you cannot even recall if the file is BASIC or machine language. Wouldn't it be nice if you could simply load in the disk directory and see the starting addresses along with the file names?

It is necessary to point out that starting addresses are not actually stored within the directory itself. They are stored in a low byte/high byte format at the very beginning of each program file. To display these would require that each individual program file be opened, address bytes fetched, file closed, and the process continued until the end of the directory is reached. On a large directory listing this would take a considerable amount of time.

The solution to this is *Easy Address*. With this short machine language utility you can display the address of any particular file or files you desire with merely a key press.

Easy Address is a machine language program written in the form of a BASIC loader. Since the program erases itself in memory after it has run, be sure to first save a copy to disk immediately after typing the program in.

Using this utility is a snap. First you must load and run *Easy Address*. Next, find a disk that contains one or more files of which you would like to see the starting addresses. Insert the disk in the drive, load the directory, and then list it. If you are using the DOS Wedge you can accomplish the same thing by simply typing "@$" and pressing RETURN. Now, just move the cursor to the line containing the file name you would like to find the address to and press CTRL/A. The disk drive will briefly start up and then the file's starting address will be displayed just to the right of the file name. You may view as many addresses as you wish by moving the cursor to the proper line and pressing CTRL/A again. You can also swap disks and load in a new directory if you desire.

Easy Address is interrupt-driven; therefore it is a good idea to disable this utility after you are through using it. This can be done by using the usual RUN STOP/RESTORE combination. It can be reenabled with SYS 828 provided that no other program has since used the RAM in the cassette buffer (828-1029).

This utility works only on "PRG" file types. Attempting to use it on other file types will not hurt anything, it just won't work! "SEQ" and "REL" files do not have starting addresses.

If you are like me you've probably amassed several disks that contain miscellaneous "type-in" programs. It would be a good idea to save a copy of *Easy Address* on each of these for your convenience in use. I'm sure you will find it a useful resource to your software library. —David Roth

McAlester, OK

```
•10 REM * EASY ADDRESS BY DAVID ROTH *
•20 FORI=828 TO 1008:READA:CK=CK+A:POKEI,
 A:NEXT
•30 IF CK<>20726 THEN PRINT"ERROR IN DATA
 STATEMENTS.":STOP
•50 PRINT CHR$(147)"USE CTRL/A TO GET ADD
 RESSES.":SYS 828:NEW
•60 DATA 120,169,77,141,20,3,169,3,141,21
```

```
,3,169,0,133,2,88
·70 DATA 96,173,141,2,41,4,240,10,165,197
,201,10,208,4,165,2
·80 DATA 240,3,76,49,234,169,255,133,2,16
9,0,133,187,169,2,133
·90 DATA 188,169,0,133,183,165,209,166,21
0,133,3,134,4,169,5,24
·100 DATA 101,3,133,3,169,0,101,4,133,4,1
60,19,177,3,201,16
·110 DATA 208,92,160,0,177,3,201,34,208,8
4,230,3,177,3,201,34
·120 DATA 240,24,72,41,64,170,104,41,63,2
01,32,176,2,9,64,224
·130 DATA 64,208,2,9,128,145,187,200,16,2
26,132,183,169,96,133,185
·140 DATA 169,8,133,186,32,213,243,165,18
6,32,180,255,165,185,32,150
·150 DATA 255,166,214,160,29,24,32,240,25
5,32,165,255,170,32,165,255
·160 DATA 32,205,189,166,214,160,0,24,32,
240,255,32,66,246,169,0
·170 DATA 133,2,76,49,234
```

WHIRLPOOL C-64

In searching for ways of enhancing title screens, game screens, etc., I came up with *Whirlpool.* This program will make your screen turn into your kitchen sink as the water goes down the drain.

After you've typed in a copy, run it. The loader will POKE the data into memory. At the top of the screen you will see a number. This number will increment from 0 to 16666. If the last number is not 16666 there is an error, and an error message will appear. But if everything goes well, you will be prompted how to use the ML program. To start the entrancing effect, type SYS 49152 and to stop it before you get dizzy, type SYS 49155. Have fun! – Jeffrey D. Panici
Sandwich, IL

```
·10 REM WHIRLPOOL- C64/(C) 1988
·20 REM BY JEFFREY D. PANICI
·25 REM TO STARTSYS49152 TO STOPSYS49155
·30 REM LOADER
·40 CK=.:PRINTCHR$(147):FORC=49152TO49342
:READD:POKEC,D
·41 CK=CK+D:PRINT"[HOME]LOADING ";CK:NEXT
·42 IFCK<>16666THENPRINT"ERROR[3"!"] IN D
ATA..":END
·45 PRINT"SYS 49152 TO START SYS 49155 TO
 STOP.":END
·50 REM ML DATA
·55 DATA 76,49,192,76,112,192,0,0
·60 DATA 1,2,3,4,5,6,7,7
·70 DATA 7,7,7,6,5,4,3,2
·80 DATA 1,0,0,0,4,5,6,7
·90 DATA 7,7,7,6,5,4,3,2
·100 DATA 1,0,0,0,0,1,2,3
·110 DATA 4,120,169,88,141,20,3,169
·120 DATA 192,141,21,3,169,1,141,26
·130 DATA 208,169,0,141,18,208,173,17
·140 DATA 208,41,119,141,17,208,173,22
·150 DATA 208,41,247,141,22,208,88,96
·160 DATA 173,25,208,41,1,240,11,169
·170 DATA 1,141,25,208,32,150,192,76
·180 DATA 49,234,104,168,104,170,104,64
·190 DATA 120,169,128,141,26,208,169,49
·200 DATA 141,20,3,169,234,141,21,3
·210 DATA 173,22,208,41,240,9,8,141
·220 DATA 22,208,173,17,208,41,240,9
·230 DATA 11,141,17,208,88,96,174,6
·240 DATA 192,173,22,208,41,248,29,7
·250 DATA 192,141,22,208,173,17,208,41
·260 DATA 248,29,28,192,141,17,208,238
·270 DATA 6,192,173,6,192,201,21,144
·280 DATA 5,169,0,141,6,192,96
```

ONE-TOUCH

Are you 64 users out there aggravated by having to hit the RUN STOP key along with RESTORE? Yeah? Then you'll appreciate this neat little down-and-dirty programming trick: the short BASIC program below repoints the NMI handler so that the subroutine checking for the RUN STOP key is bypassed. Next, a small ML "wedge" routine is inserted into the BASIC main loop to make sure that the NMI alterations stay intact. The result: a one-touch RESTORE key! You'll enjoy the convenience, and your RUN STOP key can take a well-deserved rest. – Barry L. Camp
Berrien Springs, MI

```
·1 REM     ONE-TOUCH RESTORE KEY
·2 REM        BY  BARRY L. CAMP
·3 REM
·4 REM        TO DISABLE, TYPE:
·5 REM  SYS58451:SYS64789  [RETURN]
·6 :
·7 A=2024:FORX=ATOA+10:READY:POKEX,Y:NEXT
·8 POKEA+11,PEEK(770):POKEA+12,PEEK(771)
·9 POKE56333,127:POKE771,A/256:POKE770,((
A/256)-PEEK(771))*256
·10 POKE56333,129:PRINT"[DOWN]ONE-TOUCH R
ESTORE ENGAGED.":NEW
·11 DATA169,102,160,254,141,24,3,140,25,3
,76
```

SCREEN LINE REVERSER

The following programs are for the 64 and 128 in 40 columns. These routines will reverse any number of characters on any screen line beginning at any column. It takes the form SYS(address), row, col, no. of characters. If the number of characters exceeds characters remaining on the line, the extra characters will be ignored. In other words, the reversal will not wrap to the next line. The routines are completely relocatable (change the variable SA).

To undo the reversal, call the routine again with the same parameters. Put the routine in a loop to flash a high score or to call attention to an error condition. Or use it to hilight a menu selection.

Unlike most C-128 screen operations, row and column

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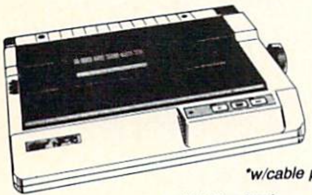
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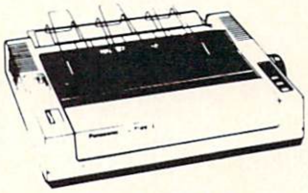
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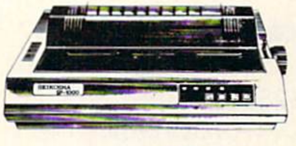
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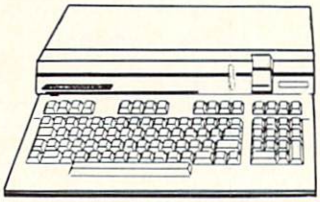
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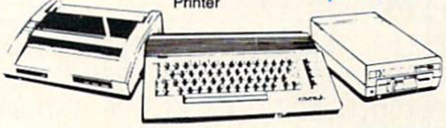
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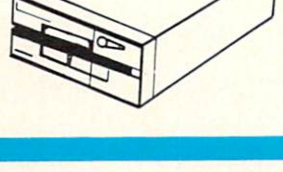
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are the absolute screen coordinates, not the relative coordinates of the current window. Some simple math can be used to confine the reversal to the current window. Location 228 holds the absolute bottom row, 229 the top row, 230 the left column, and 231 the right column.

—Richard Curcio

64 VERSION

```
•100 SA=828:CK=0
•110 FORA=0TO76:READD
•120 POKESA+A,D:CK=CK+D:NEXT
•130 IFCK<>11089THENPRINT"[3"*"] DATA ERR
OR [3"*"]":END
•140 PRINT"SCREEN LINE REVERSER":PRINT
•150 PRINT"SYS"SA"[LEFT],ROW,COL,NUMBER O
F CHARACTERS"
•160 END
•170 DATA32,155,183,224,25,176,67,134
•180 DATA174,32,155,183,224,40,176,58
•190 DATA134,175,166,174,181,217,41,127
•200 DATA133,194,189,240,236,133,193,24
•210 DATA165,175,101,193,133,193,144,2
•220 DATA230,194,169,41,229,175,133,175
•230 DATA24,32,155,183,228,175,144,2
•240 DATA166,175,134,174,160,0,177,193
•250 DATA73,128,145,193,200,196,174,144
•260 DATA245,96,76,72,178
```

128 VERSION

```
•100 REM *** LINE REVERSE 128 ***
•110 SA=4864:REM LOCATABLE
•120 CK=0:FORI=0TO61:READD:POKESA+I,D:CK=
CK+D:NEXT
•130 IFCK<>8767THENPRINT"** ERROR IN DATA
 **":END
•140 PRINT"TO USE: SYS"SA"[LEFT], ROW, CO
L, # OF CHRS":END
•150 DATA36,215,48,57,201,25,176,53
•160 DATA224,40,176,49,134,175,170,189
•170 DATA76,192,133,196,189,51,192,24
•180 DATA101,175,133,195,144,2,230,196
•190 DATA169,41,229,175,133,175,152,170
•200 DATA228,175,144,2,166,175,134,174
•210 DATA160,0,177,195,73,128,145,195
•220 DATA200,196,174,144,245,96
```

SIMPLE RAM DISK

While playing with my 1750 RAM Expansion and a memory map of the C-128, I discovered a primitive way to use the 1750 as a RAM disk. It can store eight BASIC programs for immediate retrieval. The programs can be up to 180 blocks in length. They are stored in banks 0 through 7 in the 1750. The program will work with the 1700 but only with two programs (Banks 0 & 1). The program uses three Function Keys:

F4: Read from the requested Bank number
F6: Write to the requested Bank number
F8: Swap the program in memory for the one in the requested Bank Number

```
•10 KEY 4,"B= :BANK0:FETCH2,4624,4624,B:F
ETCH 46080,7168,7168,B:BANK15:"+CHR$(27)
+"J[RIGHT][RIGHT]"
•20 KEY 6,"B= :BANK0:STASH2,4624,4624,B:S
TASH 46080,7168,7168,B:BANK15:"+CHR$(27)
+"J[RIGHT][RIGHT]"
•30 KEY 8,"B= :BANK0:SWAP2,4624,4624,B:SW
AP 46080,7168,7168,B:BANK15:"+CHR$(27)+"
J[RIGHT][RIGHT]"
```

—Steve Stutts
Loretto, TN

COLOR SQUARES 128

This short program is quite a workhorse. It allows you to create low-resolution graphics in 128 80- or 40-column mode (although 80-column looks better). Your paint brush, represented by an asterisk, starts in the center of the screen. By using a joystick in Port 2 you move the asterisk and push the button to turn a square "on." Be careful, though; a square is erased if you go over it a second time. To change colors, press the C key and type a number 1-16, (the color codes appear on pages 247-248 in the 128 system guide). Press the E key to erase the entire screen and the H key to return to home position in the upper left corner. Also, be careful about moving the asterisk off the sides of the screen, as this causes gaps in your picture. Have fun!

—Blake Buckley
Hereford, TX

```
•10 S=0:PRINT"[CLEAR]":FORX=1TO11:PRINT:N
EXT:A$="[UP][RIGHT][DOWN][LEFT]"
•15 B$="[UP][RIGHT][DOWN][RIGHT][DOWN][LE
FT][UP][LEFT]":PRINTCHR$(27)+"M":PRINTTA
B(40)"*[LEFT]";
•20 FORP=1TO20:NEXT:GETZ$:IF Z$<>""THENGO
SUB110
•30 J=JOY(2):IF J=0THENGOTO20
•40 IF J>127THENGOTO100
•50 IFS=1THENPRINT"[RVSON] [RVSOFF]";:GOT
O 70
•60 PRINT" ";
•70 IFINT(J/2)=J/2 THEN GOTO90
•80 J=(J+1)/2:PRINTMID$(A$,J,1);"[LEFT]*[
LEFT]";:S=0:GOTO20
•90 J=J-1:PRINTMID$(B$,J,2);"[LEFT]*[LEFT
]";:S=0:GOTO20
•100 PRINT"[RVSON] [RVSOFF][LEFT]";:S=1:G
OTO20
•110 PRINT" ";:IF Z$="E"THENPRINT"[HOME]*
[LEFT]";
•120 IFZ$="H"THENPRINT"[HOME]*[LEFT]";
•130 IF Z$="C"THENINPUT"[HOME]";CL:COLOR
5,CL:PRINT"[HOME][5" "][HOME]*[LEFT]"
•140 RETURN
```

VANISH

*V**anish* is the ultimate projectile game, played in three dimensional perspective, in which each player literally tries to hold his ground.

Designed for the Commodore 128 and played on the 40 column graphic screen, the game requires two joysticks, one for each player.

The object of the game is to protect your grid squares from the starlike projectile. If the projectile hits a grid square, it will vanish. If you are on the vanished grid square, you fall into oblivion and the game is over. The game will also end if you only have one square left on your side if you move totally off the grid.

You have a paddle that you can move anywhere on the grid if you are on the receiving end. The other player will not be able to move his paddle at this time—only the receiver's paddle can move. The paddle is used to catch the projectile. This is one of two ways you can change from a receiver to a sender. If the projectile is controlled by the computer, it will automatically send the projectile to the other player. If the projectile is player-controlled, you use your joystick to determine the row and column you want the projectile to land on in your opponent's grid. If you select a grid square that has been hit previously, the positions of receiver and sender will be reversed.

To select which row and column you want, you must hold the joystick in one of the four horizontal-vertical positions and press the fire button. Each position represents a number from 1 to 4. The positions up, right, down, and left represent the numbers 1, 2, 3, and 4 respectively.

The options available to the players are as follows:

Control selection: You choose whether to let the computer select which grid square the projectile will hit, or to let each player decide for himself/herself. The default selection is the computer.

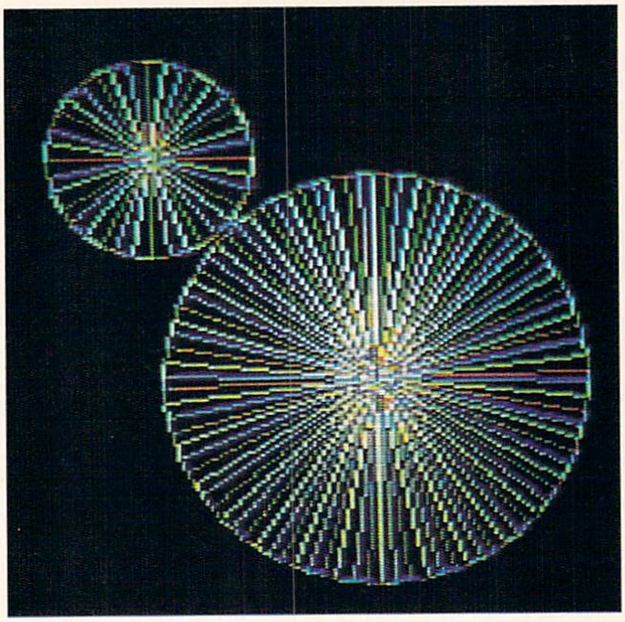
Projectile's relative speed: This determines the relative velocity of the projectile towards your grid squares. The default choice is the speed of sound, relatively speaking. The slowest speed is highway traffic and the fastest is the speed of light.

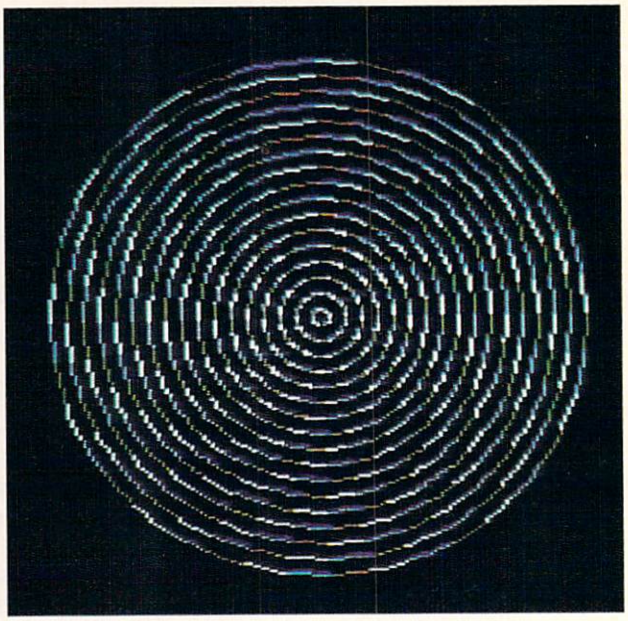
Skill level of play: The three levels are amateur, semipro, and professional. The player's paddle will have the largest dimensions in the amateur level, and will not change size no matter where the player moves. In the semi-pro level the paddle will be slightly smaller. The professional level is only for those who have mastered the other two levels. In this level the paddle changes size according to the position you are at. The default choice is amateur level. □

SEE PROGRAM LISTING ON PAGE 64

For the C-128

By Leonard Morris





PHOTOS: MICHAEL R. DAVILA

REVOLVER

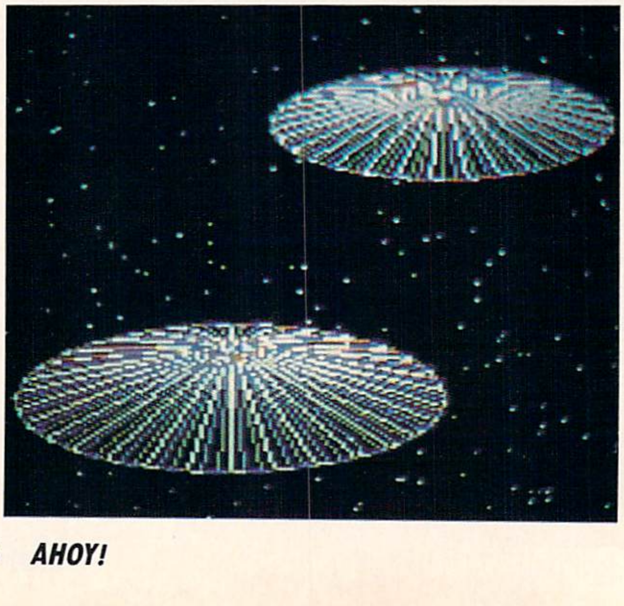
Put Action and Dazzle into Your C-128 Programs

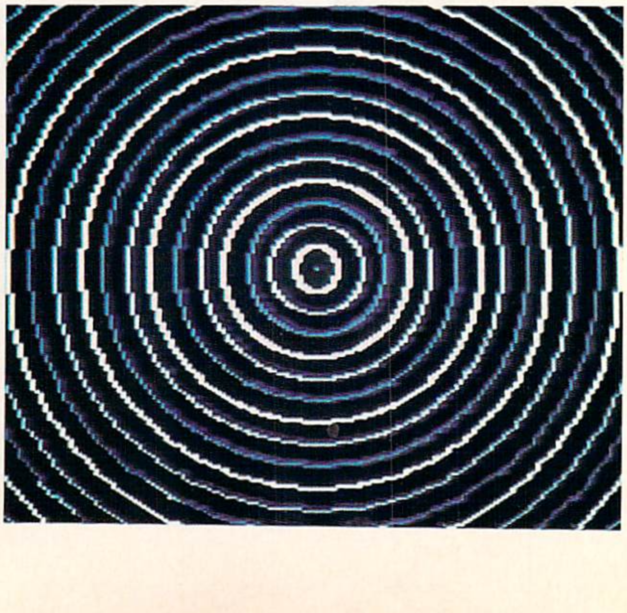
By Earl Kanady

You are writing a program on your 128 and you would like to add some motion to it to spice it up. The problem is that most animation programs gobble up more memory than you have available. Do you give up? Not with *Revolver* on your side!

Revolver is a BASIC loader program that writes a machine language program, *Revolve,* which uses only 95 bytes of memory. It allows you to write multicolor animation programs which can take up as little as one or two blocks of disk space. That is low cost animation!

The secret of *Revolve* is what it does to the three draw colors in multicolor mode. It automatically revolves them by moving Color 2 to Color 1, Color 3 to Color 2, and Color 1 to Color 3 each time the routine is called. The colors move from one screen location to another, creating an animation effect. The key to this animation is to draw your objects using the three colors in sequence. You can either use a color rotation of 1, 2, 3 or 3, 2, 1. The se-





Ahoy! DISK

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Micro Minder (8/84)
Multi Draw 64 (1/84)
Name That Star (4/84)
Post Time (6/84)
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We've collected Ahoy! 's best programs onto the Anthology Disks described here. Please note that many of these programs will be unusable without the documentation printed in the issues of Ahoy! listed in parentheses.

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quence you use will determine the direction of the motion. For instance, a spoked wheel drawn in the order 1, 2, 3, will have a clockwise spin when animated by *Revolve.* You can reverse the spin by reversing the order in which the colors are drawn. *Revolve* rotates the colors one place each time it is called. For continuous motion your program should contain a loop which calls *Revolve* as many times as you want the motion to continue.

Revolve can be called at two different addresses. The first address, 2816, automatically revolves the colors as already stated. The second address, 2840, does not rotate the colors but can be used to rewrite one or more of the multicolors wherever it appears on the screen. You can use this to selectively change one of the three colors or insert a new color value and move it from one multicolor to another.

There is only one real limitation you must observe with *Revolver.* You are only allowed a total of four colors, including the background color, for the entire screen at any one time. You can change the color value of Color 1, for instance, any time you wish; however, the color change will take place wherever Color 1 occurs.

To help you understand how *Revolver* works, a documentation program, *Revolver Demo,* has been included. It contains five different graphic routines which show some of the ways *Revolve* can be used. Rotating Wheels shows a way to use *Revolve* by calling SYS 2840. This routine could have been written to use the SYS 2816 call and the animation effect would have been the same. It is used here to illustrate one form used with the SYS 2840 call.

Action Frame shows how *Revolve* can be used to simulate linear motion. It uses SYS 2816 inside a loop to create motion. Energy Radiation uses the SYS 2816 call and shows another animation effect available with *Revolve.* Saucers in Space has two spinning saucers and twinkling stars. Spinning Spiral illustrates how to change the multicolors while maintaining an animation effect.

To get a working version of *Revolve,* type in *Revolver* using *Bug Repellent*, then save it to disk. Make sure you have a formatted disk in your drive when you run *Revolver,* because it will write the *Revolve* ML and automatically save it to disk. *Revolve* is your working program. *Revolve* can be called with SYS 2816 or, to use the program to change multicolors, SYS 2840. After you have *Revolve* saved to disk, type in the BASIC program, *Revolver Demo,* and save it to the same disk. *Revolver Demo* LOADs *Revolve* when it is run. The demo routines use the variable D to determine how long each position is displayed before the colors are rotated again. X is used to determine the length of time the animation will continue.

I hope that you'll have as much fun using *Revolver* as I have had programming it. ☐

SEE PROGRAM LISTINGS ON PAGE 71

COMMODARES

PROGRAMMING CHALLENGES

By Dale Rupert

Each month, we'll present several challenges designed to stimulate your synapses and toggle the bits in your cerebral random access memory. We invite you to send your solutions to:

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We will print and discuss the cleverest, simplest, shortest, most interesting and/or most unusual solutions. Be sure to identify the *name* and *number* of the problems you are solving. Put *your* name and address on the listings as well. Show sample runs if possible. Briefly describe your solutions and tell what makes them unique or interesting, if they are. You must enclose a stamped, self-addressed envelope if you want any of your materials returned. Solutions received by the middle of the month shown on the magazine cover are most likely to be discussed, but you may send solutions and comments any time. Your original programming problems, suggestions, and ideas are equally welcome. The best ones will become *Commodares!*

PROBLEM #61-1: KEY ARRANGER

This problem was submitted by Ian Dingle (Calgary, AB). Write the shortest and quickest program that randomly rearranges the keyboard. When you hit a "Q" you might get "2". Good luck debugging this one.

PROBLEM #61-2: STRING DELETER

The user specifies a string, a character position, and a number of letters. Write a program which deletes that number of consecutive characters from the given string starting at the given character position. For example, "COMMODARES",7,2 would result in "COMMODES". Delete to the end of the string if there are not enough characters to delete the specified amount.

PROBLEM #61-3: FIVE THREES

Try this mathematical challenge from *Fun with Figures* by J.A.H. Hunter (Dover, 1965). Two three-digit numbers are multiplied. There are only five threes and they are in the positions shown. The other digits are shown as x's.

```
    x x 3
    x x 3
    -----
    3 x x
  x 3 x
x x 3
---------
x x x x x
```

Write a program to determine and display all the digits in this multiplication.

PROBLEM #61-4: TIME CALCULATOR

Set TI$ to the current time. Write a program which takes an amount of time from the user given in the form "HHMMSS". This amount of time is subtracted and also added to the current time as given by TI$ and the results are displayed. For example, if the current time stored in TI$ is 9:43:08 and the user enters "020304", the program responds "7:40:04" and "11:46:12". Use 24-hour time.

This month we will present the most interesting solutions to *Commodares* from the September 1988 issue of *Ahoy! Wallace Leeker (Lemay, MO) mentioned his experience of deja-vu upon seeing Problem #57-1: Quickly Random* suggested by Justin Smalley (Boulder, CO). Indeed that problem appeared in the July 1988 *Commodares* under a slightly different title as *#55-2: Rapid Randomizer.* You should read our discussion of the solutions to that problem in last month's *Ahoy!*

The problem is to start with this ordered array of numbers:

```
10 DIM X(100):FOR J=1 TO 100:X(J)=J:NEXT
```

then write a routine to rearrange the array in random order as quickly as possible. The best algorithm is to take each element of the array in turn and to swap it with a randomly chosen element. After all elements have been randomly swapped, the array is in random order. This solution from Bob Rispoli (Ridge, NY) takes 99 jiffies in FAST mode on the C-128:

```
·1 REM ==================================
·2 REM  COMMODARES PROBLEM #57-1 :
·3 REM       QUICKLY RANDOM
·4 REM  SOLUTION BY
·5 REM       BOB RISPOLI
·6 REM ==================================
·10 DIMX(100):FORJ=1TO100:X(J)=J:NEXT
·15 TI$="[6"0"]"
·20 FORJ=1TO100:N=INT(RND(1)*100)+1:A=X(N
 ):X(N)=X(J):X(J)=A:NEXT
·25 PRINT TI"JIFFIES"
·30 PRINTTAB(16)"[RVSON] DONE [RVSOFF]"
·40 PRINT:PRINT"TO SEE THE REARRANGED ARR
 AY HIT ANY KEY"
·50 GETA$:IFA$=""GOTO50
·60 FORJ=1TO100:PRINTTAB(15)"X"J"="X(J):F
 ORD=1TO200:NEXT:NEXT
```

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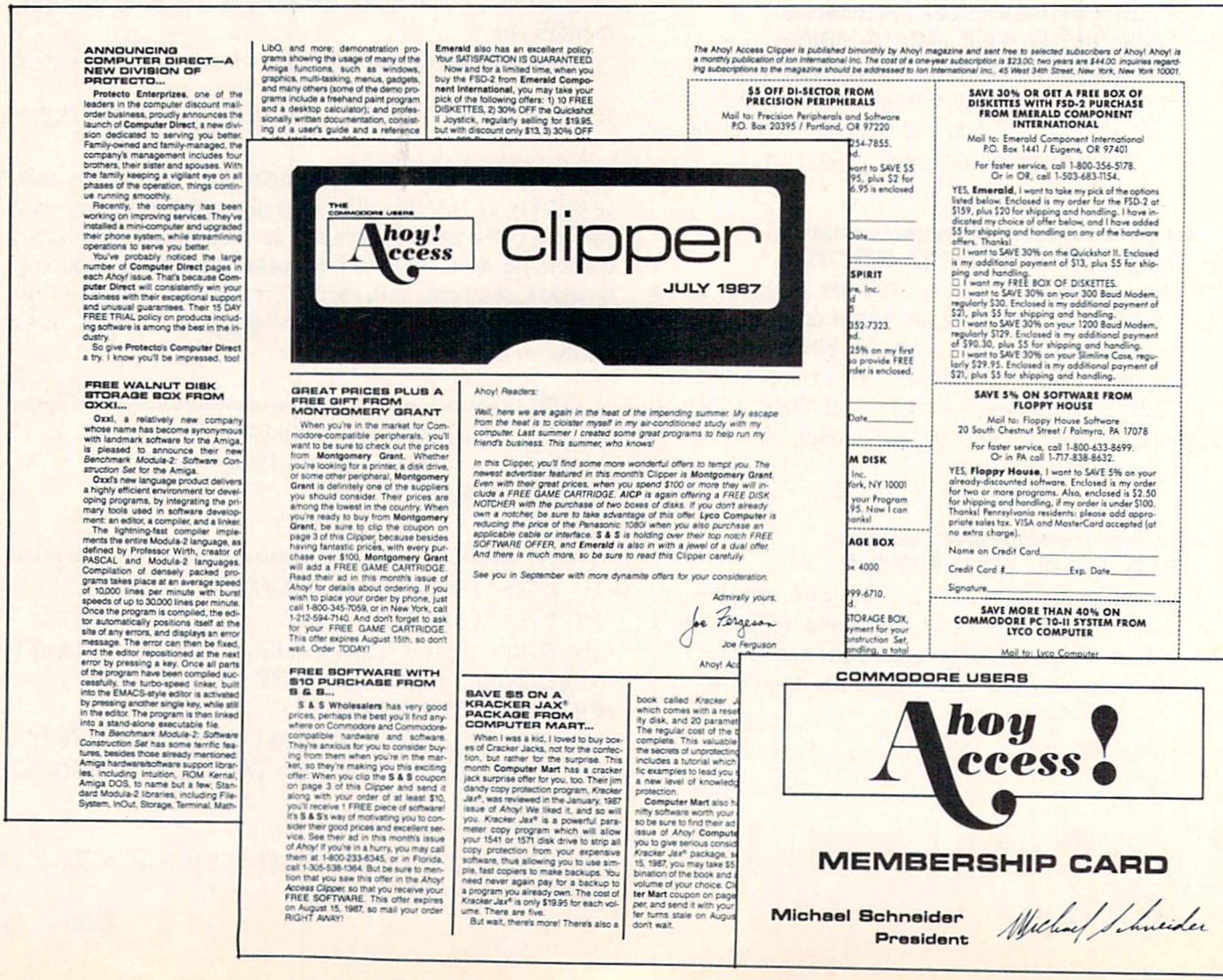
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Jim Borden (Carlisle, PA) had some good suggestions for improving the speed of the program. He suggested using the statement shown in line 15 rather than introducing another variable with a statement such as TO = TI. In general, the number of variables and the order in which they are defined affects the speed of a program.

Jim also used N=RND(.)*J instead of the corresponding statement shown in line 20. This selects elements 0 through 99 rather than 1 through 100, but the calculation of N is much quicker. To align the subscripts, rewrite line 10, as Jim did, or use the suggestion from Doug Ropp (Phoenix, AZ) presented last month. Doug added this statement at the beginning of line 20: X(0)=X(100). Now the elements of the array are contained within X(0) through X(99), and Jim's formula for N works properly. The program runs in 72 jiffies in FAST mode, nearly a 30% improvement.

Here is a machine language routine for the C-64 from Steve Morrison (Port Hueneme, CA) which places random numbers in the range 1 to 100 into addresses 49408-49507. Line 40 reads them back into the X array.

```
•1 REM ==================================
•2 REM  COMMODARES PROBLEM #57-1 :
•3 REM       QUICKLY RANDOM
•4 REM  SOLUTION BY
•5 REM       STEVE MORRISON
•6 REM ==================================
•10 FORJ=0TO64:READ A:CS=CS+A: POKE 49152
 +J,A: NEXT
•15 IF CS<>9002 THEN PRINT"DATA ERROR": S
 TOP
•20 DIMX(100):FORJ=1TO100:X(J)=J:NEXT
•30 SYS 49152
•40 FOR J=1 TO 100:X(J)=PEEK(49407+J): NE
 XT
•50 END
•100 DATA 169,0,168,153,0,193,200,192
•110 DATA 100,208,248,170,138,72,160,0
•120 DATA 32,42,192,217,0,193,240,248
•130 DATA 200,192,100,208,246,168,104,170
•140 DATA 152,157,0,193,232,224,100,208
•150 DATA 227,96,32,190,224,165,140,69
•160 DATA 141,69,142,69,143,201,100,144
•170 DATA 5,233,100,76,53,192,105,1,96
```

This takes about 250 jiffies on the C-64, but most of the time is spent in line 40, returning the shuffled values to BASIC. You might enjoy disassembling Steve's routine to see how it works. On the C-128 you might use the POINTER function to locate X(J) in memory and modify Steve's machine language routine to place the random numbers directly into X(J).

Problem #57-2: Team Play was a very tough one suggested by Dale Goupell (Alpena, MI) and William Slupe (Boise, ID). The problem is to print out schedules for tournament play. Dale wanted a schedule for 10 teams so that each team is played once in each half-season. The season is 18 weeks long. Also, each team should play once at home and once away with every other team.

This solution was sent by Fred Ransom (Oxnard, CA) in response to *Problem #32-3: Round Robin,* and it can be used to meet the requirements of this problem:

```
•1 REM ==================================
•2 REM     COMMODARES PROBLEM #57-2 :
•3 REM         TEAM PLAY
•4 REM     SOLUTION BY
•5 REM         FRED RANSOM
•6 REM ==================================
•10 INPUT "NUMBER OF TEAMS";N
•20 DIM T$(N): PRINT"GIVE TEAM NAMES:"
•30 FOR K=0 TO N-1
•40 PRINT"TEAM NUMBER ";K+1;: INPUT T$(K)
•50 NEXT K
•55 IF (N AND 1) THEN N=N+1:T$(N-1)="[3"-
 "]"
•60 INPUT "TO (P)RINTER OR (S)CREEN [S]";
 FL$
•70 DEV=3 : IF FL$="P" THEN DEV=4
•80 OPEN 4,DEV
•90 FOR J=1 TO N-1
•100 FOR A=1 TO 3 : PRINT#4 : NEXT
•110 PRINT#4,"ROUND ";J
•120 PRINT#4,"HOME", "AWAY"
•130 PRINT#4,"[6"="]", "[6"="]"
•140 FOR K=0 TO (N/2-1)
•150 IF (J AND 1)=1 THEN PRINT#4, T$(K),
 T$(K+N/2)
•160 IF (J AND 1)=0 THEN PRINT#4, T$(K +
 N/2), T$(K)
•170 NEXT K
•180 A$=T$(1)
•190 IF N < 3 THEN 240
•200 FOR K=2 TO N-1
•210 T$(K-1)=T$(K)
•220 NEXT K
•230 T$(N-1)=A$
•240 NEXT J
•250 CLOSE 4
```

As written, the program prints the schedule of the first N-1 games for N teams. The second N-1 games are against the same teams but with "HOME" and "AWAY" swapped. You can modify the program to display those games.

The second part of this problem was to set up William's tennis doubles matches. There are 3 sets per week on 3 different courts for 12 weeks. Each set consists of 2 teams with 2 players on each team. There are no fixed teams. The goal is to have the players, partners, and opponents change to the greatest extent possible.

Richie Vance (Buchanan, TN) sent a solution with a nice printout of the matches. He randomly picked players who had not already been picked for each set. This seems like a fairly fair way to go about it, although there will certainly be some complaints about the results.

```
•1 REM ==================================
•2 REM     COMMODARES PROBLEM #57-2 :
```

```
•3 REM       TEAM PLAY
•4 REM    SOLUTION BY
•5 REM       RICHIE VANCE
•6 REM ===================================
•10 FAST: PRINT"WORKING [3"."]"
•20 DATA ANDY,BILL,CRIS,DAVE,EDDY,FRED,GA
 RY,HANK,JOEY,MATT,NEIL,TONY
•30 DIM PL(12,36),PL$(12),PY(12):FORI=1TO
 12:READ PL$(I):NEXT
•40 FOR WE=1 TO 12: PRINT"WEEK #";WE: FOR
  SE=1 TO 3: FOR CO=1 TO 3
•50 PL=INT(RND(1)*12)+1:ET=(WE-1)*3+SE:IF
  PY(PL)<>0 THEN 50: ELSE PY(PL)=1
•60 IF TN=0 THEN PL((CO-1)*4+1,ET)=PL: TN
 =1: GOTO 50
•70 IF TN=1 THEN PL((CO-1)*4+2,ET)=PL: TN
 =2: GOTO 50
•80 IF TN=2 THEN PL((CO-1)*4+3,ET)=PL: TN
 =3: GOTO 50
•90 IF TN=3 THEN PL((CO-1)*4+4,ET)=PL: TN
 =0
•100 NEXT CO: FOR I=1 TO 12: PY(I)=0: NEX
 T I,SE,WE
•110 SLOW
•120 PRINT"[DOWN][DOWN][4"[RIGHT]"]PRINT
 SCHEDULE.  PLEASE WAIT."
•130 S1$="[15" "]":S2$=LEFT$(S1$,13)
•140 OPEN 4,4:FOR WE=1 TO 11 STEP 2: IF W
 E=5 OR WE=9 THEN FOR V=1 TO 23: PRINT#4:
  NEXT V
•150 PRINT#4:PRINT#4:PRINT#4:PRINT#4,S2$"
 [3"*"] WEEK"WE"[3"*"]"S2$S2$"[3"*"] WEEK
 "WE+1"[3"*"]"
•160 FOR SE=1 TO 3: PRINT#4: PRINT#4: PRI
 NT#4,S1$"--SET  "CHR$(64+SE)"--"S1$S1$"-
 -SET  "CHR$(64+SE)"--"
•170 PRINT#4,"[3" "]COURT 1[5" "]COURT 2[
 5" "]COURT 3[12" "]COURT 1[5" "]COURT 2[
 5" "]COURT 3"
•180 FOR X3=0 TO 1: FOR X1=WE TO WE+1: FO
 R X2=0 TO 2
•190 PRINT#4," "PL$(PL(X2*4+1+X3*2,(X1-1)
 *3+SE))" & "PL$(PL(X2*4+2+X3*2,(X1-1)*3+
 SE));
•200 NEXT X2: IF X1/2<>INT(X1/2) THEN PRI
 NT#4,"[7" "]";
•210 NEXTX1:IFX3=0THENPRINT#4,"[6" "]VS.[
 9" "]VS.[9" "]VS.[16" "]VS.[9" "]VS.[9"
 "]VS."
•220 NEXT X3,SE,WE: PRINT#4: CLOSE 4: END
```

You may want to modify Richie's program to allow either screen or printer output as in Fred's program above. Congratulations also to Paul Cortez (Sepulveda, CA) and George Gaudette (Lakeland, FL) for their solutions to these challenging problems.

Now for *Problem #57-3: Simple Addition* suggested by Necah Buyukdura (Ankara, Turkey). Given the following DATA statement:

```
10 DATA 9,85,"4,356","13,765","759,215"
```

you were to write the shortest program to read the amounts, then calculate and print their sum. The quotation marks are used because of the commas within the last three amounts. (Several readers pointed out that the original problem described *six* items, but the listing showed only five. I'm not really sure where the sixth item went. Surprisingly, some readers also predicted that the missing amount was between 100 and 999! In fact, the third item was supposed to be 347, but it got mislaid.)

The following listing shows a representative sampling of the many solutions to this problem.

```
•1 REM ===================================
•2 REM    COMMODARES PROBLEM #57-3 :
•3 REM        SIMPLE ADDITION
•6 REM ===================================
•10 DATA 9, 85, "4,356", "13,765", "759,2
 15"
•90 REM    ==============================
•100 REM  === SOLUTION BY SARANG GUPTA =
 =======================================
•110 FOR I=1 TO 5: READ A$: B=INSTR(A$+",
 ",","): C=C+VAL(LEFT$(A$,B-1)+MID$(A$,B+
 1)): NEXT: PRINT C
•120 RESTORE: REM ====================
•200 REM  === SOLUTION BY KEITH KUSHNER
 =======================================
•210 FOR T=1 TO 5: READ A$: Q=Q+VAL(RIGHT
 $(A$,3))-1E3*VAL(A$)*(LEN(A$)>3): NEXT:
 PRINT Q
•220 RESTORE: REM ====================
•300 REM  === SOLUTION BY PAUL CORTEZ
 =======================================
•310 FOR I=1 TO 5: READ A$: B$=STR$(VAL(A
 $)): N=N+VAL(B$+MID$(A$,LEN(B$)+1)): NEX
 T: PRINT N
•320 RESTORE: REM ====================
•400 REM  === SOLUTION BY WALLACE LEEKER
 =======================================
•410 FOR X=1 TO 5: READ A$: I=INSTR(A$,",
 "): SUM=SUM+1000*VAL(LEFT$(A$,I))+VAL(MI
 D$(A$,I+1,3)): NEXT: PRINT SUM
```

Each of the solutions fits on one line of the C-128. Some of the solutions work only on the C-128. The second and third solutions fit on one line of the C-64 if you use abbreviations. You should be able to analyze each of these to see how they work. The solutions are from Sarang Gupta (Albuquerque, NM), Keith Kushner (Brooklyn, NY), Paul Cortez (Sepulveda, CA), and Wallace Leeker (Lemay, MO). Thanks to many other readers with similar solutions.

Bob Renaud (Washington, MA) solved problems *57-1* and *57-3*, but he avoided the other two problems. He said that those two are entirely too practical and useful for him to indulge in. His philosophy for the whole purpose of a home

computer (and I quote) "...is to waste valuable time and energy in pursuit of the creation and perfection of utterly meaningless frivolities that have no conceivable application in the real world." Well said, Bob. That sounds like the *Commodares* motto. Notice that having a good time as well as achieving intellectual enlightenment are not excluded from the process. That's what we're here for.

In spite of its possible practicality, we will finish up with *Problem #57-4: Screen Saver* suggested by Allistair McPhee (Melbourne, Australia). The problem is to save the C-64 high resolution screen on tape or disk. The program should use variables so the location of the screen to be saved can be easily changed.

This solution from Paul Cortez is the essence of brevity.

```
•1 REM ==================================
•2 REM     COMMODARES PROBLEM #57-4 :
•3 REM        SCREEN SAVER
•4 REM     SOLUTION BY
•5 REM        PAUL CORTEZ
•6 REM ==================================
•8 F$="SCREEN":D=8:S=8192:E=16191+1
•9 SYS57812F$,D:POKE780,251:POKE251,SAND2
55:POKE252,S/256:POKE781,EAND255:POKE782
,E/256:SYS62941
```

The filename is stored in F$. The starting address of memory to be saved is in S and the ending address is in E. Notice that E is actually one more than the ending address value. D is the device number (8 for disk).

Paul said that the routine at 57812 accepts the parameters for opening the file (notice that F$ immediately follows the SYS command without a colon). The routine at 62941 writes the file to the output device from the locations pointed to by the A, X, and Y registers.

To restore the high resolution screen image from the file, use the LOAD"filename",8,1 command. Enter hi-res graphics mode (refer to the *Programmer's Reference Guide)* to see the restored image. A more general screen saver program was presented in the September 1988 issue of *Ahoy!* See *Video Snapshot* by Jim Partin in that issue for a program to save any type of graphics or text screen for the C-64 at the touch of a key.

Good luck with next month's challenges. Keep those solutions and suggestions coming. ☐

Congratulations also to these readers who sent valid solutions this month and were not already mentioned.

Rich Allen (Layton, UT)
Carlos Centeno (Lares, PR)
Craig Ewert (Crystal Lake, IL)
Steven Freedman (Chicago, IL)
Thomson Fung (San Diego, CA)
Jim Schuster (Fairpoint, OH)
Justin Smalley (Boulder, CO)
Terrence Stender (Kalamazoo, MI)
Allen Wells (Black Creek, BC)

SCREEN POCUS REVISITED

By Richard Curcio

Last month's *Screen Pocus* program by Peter Lottrup can be made compatible with sound programs. The incompatibility comes from *Pocus's* use of the SID chip's voice 3 waveform, set for noise, to generate random numbers. To prevent the noise waveform from being heard, SID's output volume is set to zero. Parts of the new DATA statements replace the steps to set up SID with NOPs. The modification uses a different source of random numbers: the low byte of timer A in CIA 1 (location 56324). Timer A is used to generate the 60Hz interrupt and the low byte register continuously counts down at a rapid rate. It is by no means random, but it decrements so rapidly that PEEKing it, even at ML speeds, gives a fairly unpredictable number. The resulting *Pocus* display is unnoticeably less random.

(The high byte of timer A decrements *too* rapidly. Unless the interval between reads is highly irregular, the values returned will always be in a descending order. This phenomenon is similar to the "aliasing" that can occur in sound sampling.)

Another source of rapidly changing 8 bit numbers is the VIC chip's raster register at 53266. At any instant, this register holds the number of the screen raster line being scanned by the CRT electron beam. This register counts up at 15KHz. To get *Pocus* to use the raster register, remove the REMs in front of the new lines 50 and 60.

To implement these changes, load the original loader into your computer and enter the new DATA statements in lines 100, 140-170, 220, and 330. Change the checksum in line 30 to 27904. Delete the old lines 50-70 and type in the new lines 40-60. The new line 40, combined with the new DATA in line 100, simplifies the relocation process. ☐

```
•30 IFCK<>27904THENPRINT"ERROR IN DATA":S
TOP                                       FO
•40 A=SA+164:B=INT(A/256):C=A-B*256:POKES
A+153,C:POKESA+154,B                      EJ
•50 REM A=53266:B=INT(A/256):C=A-B*256:PO
KESA+140,B:POKESA+139,C                   KH
•60 REM POKESA+73,B:POKESA+72,C           IO
•100 DATA 184,80,3,184,80,45              MK
•140 DATA 3,234,234,234,234,234           NB
•150 DATA 234,234,234,234,234,234         HO
•160 DATA 234,234,234,234,234,234         KM
•170 DATA 234,234,234,169,160,141         MK
•220 DATA 4,220,168,177,251,209           CI
•330 DATA 173,4,220,201,128,144           BG
```

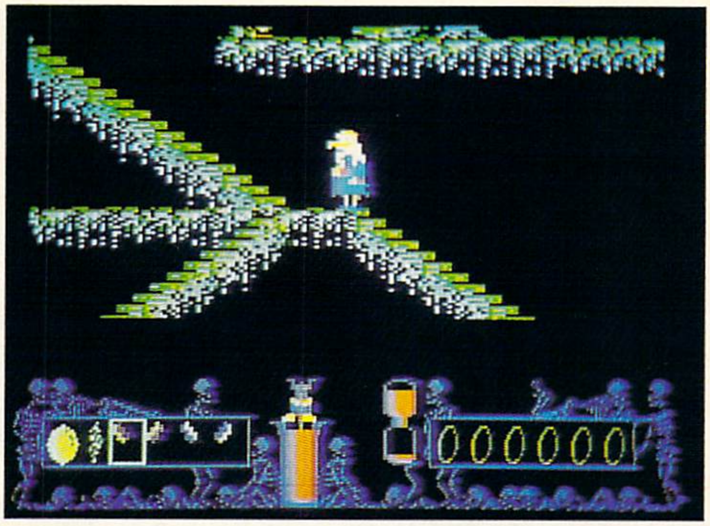


PHOTO: MICHAEL R. DAVILA

Vampire's Empire *is less frantic than similar games which emphasize shooting, giving the computerist some time to plan strategy, such as the placement of mirrors.*

VAMPIRE'S EMPIRE
DigiTek
Commodore 64
Disk; $29.95

The classic horror movie war between Dr. Van Helsing and Count Dracula continues in game form in *Vampire's Empire.* The now aged evil-fighter, shown in well-animated side perspective, must stalk the King of the Vampires into the depths of his subterranean lair.

In this action-adventure, the player guides Van Helsing through the 240 multilevel screens which comprise Dracula's domain. Moving the stick without pressing the button allows Van Helsing to walk, turn around, kick enemies, and use the numerous staircases.

The wizened hero looks great as he hurries along the horizontal corridors, but steering him up or down steps is sometimes frustrating. The computerist must precisely position Van Helsing to make him use a staircase. In an otherwise fast-moving game, stairs can cause an irritating delay.

Pressing the button while pulling the stick to 6 o'clock activates Van Helsing's equipment. The inventory is shown in a box in the lower lefthand corner of the playfield. It includes three types of objects: mirrors, garlic, and magic balls of light.

The garlic is primarily used to repel the many monsters who guard Dracula's stronghold. The mirrors are an ingenious plan to defeat Dracula by illuminating the Vampire Lord's crypt. The player must set up mirrors so that they reflect light from the surface into the gloom of the crypt.

The Magic Ball makes the tricky business of aiming light a bit easier. It catches a light ray and redirects it where the player wants it to go.

When the Magic Ball is framed in the inventory window, holding the button and moving the stick up and down moves it around the playfield. Once the player captures the beam, pointing the stick and releasing the button sends it in the desired direction.

The blood-drinking monsters are easy to underrate, because they kill slowly by sapping Van Helsing's strength. They're deadly in the long run, and the game ends quickly if Van Helsing gets trapped in a dead end corridor with one of these creatures. A bottle of rich red blood on the screen slowly empties to reflect the deterioration of the hero.

Vampire's Empire is less frantic than similar games which emphasize shooting. This gives the computerist a little time to plan strategy, especially the placement of the mirrors. *Vampire's Empire* probably won't be anyone's favorite program, but it should please many fans of this popular genre.

DigiTek, Inc., 10415 N. Florida Ave., Suite 410, Tampa, FL 33612 (phone: 813-933-8023).

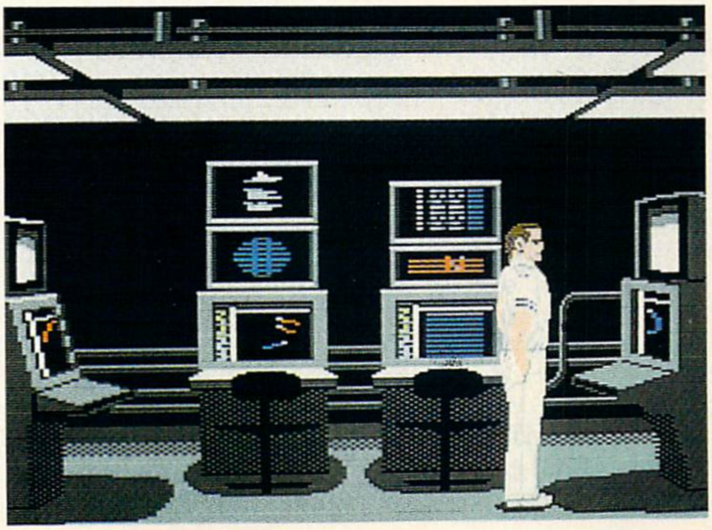
–Arnie Katz & Bill Kunkel

Circle #250 on Reader Service Card

RED STORM RISING
MicroProse
Commodore 64
Disk; $39.95

"Red Storm Rising," the novel by Tom Clancy, is a near-future scenario





Red Storm Rising *requires a much greater commitment of time and energy than most simulations. The graphics, while realistic, may be aesthetically disappointing to some.*

for World War III set aboard a state of the art U.S. nuclear submarine. This should not be confused with "The Hunt for Red October," another submarine saga by Clancy which was previously turned into a computer game by Datasoft/Intellicreations.

This tale is much more appropriate for computer simulation. Unlike "Red October," where the player's objective is to *avoid* confrontations, "Red Storm" has lots of combat involving super-scientific weaponry as NATO goes head-to-head with the Warsaw Pact.

Red Storm Rising was given an astonishingly detailed treatment by designers Sid Meier and Arnold Hendrick. Their design is capped off with C-64 programming by Meier, Richard Orban, and the legendary Silas "Castle Wolfenstein" Warner, who clearly spent months absorbing and recreating Clancy's storyline.

Let the user beware, however. *Red Storm Rising* will be something of a shock for long-time MicroProse devotees. The problems first appear in an introduction to the game written by Clancy. This appears in the 100+ page instruction book:

"You are the commanding officer of an American SSN, a nuclear-powered fast-attack submarine. The word has only just arrived from National Command Authority: Your country is at war..."

"You are thirty-nine years old. A graduate of the U.S. Naval Acadmey, you've worked your way up the ladder of your chosen profession: Nuclear Power School; Prototype School; Submarine Officers Basic School; Prospective Nuclear Engineer Officer School; etc. etc. etc."

It's one thing in a role playing game to say that the player is controlling a character of a certain strength, experience, wisdom, dexterity, and durability. It's another to assume that the user can step right into the shoes of an elite submarine commander without considerably more assistance than *Red Storm Rising* offers.

Strangely enough, this simulation lacks ease of play and high graphics content, two elements that have been the cornerstones of previous MicroProse entries. Not only is *Red Storm* tremendously complex, but the graphics may disappoint some users (if not from a realistic viewpoint, then from an aesthetic one).

There's no doubting that the Weapons Control screen, for example, is an accurate representation of what a commander on a nuke sub would see, but the brute fact is there is very little game heat generated by watching dots move about on a grid.

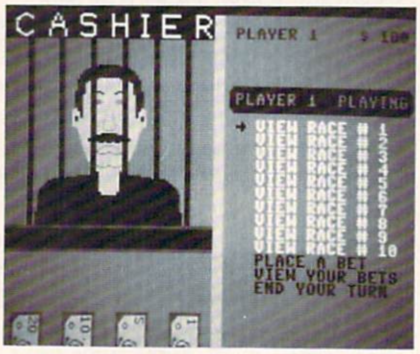
The user, cast as a sub commander caught on maneuvers in the Atlantic when war breaks out, can enter the game at any of four points in the timeline: 1984 (the Russians are behind us in sub and computer technology but U.S. subs have limited weaponry), 1988 (Russian subs improved but U.S. subs have added Tomahawk missiles), 1992 (the Ruskies have a nuke aircraft carrier while we've added SeaLance missiles and Stinger masts), or 1996 (Russia has a large fleet but the U.S. has the new SeaWolf submarine). The player also selects one of five subs (though not all are available in every scenario) and opts for his choice of four difficulty levels.

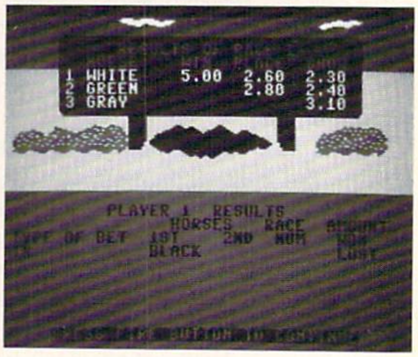
The player can access a gaggle of technology, consoles, and visual displays. The three display areas are navigation, primary, and secondary. Navigation is always visible on the upper left side of the screen. The secondary display underneath the navigation screen offers five displays, while the primary display occupies the lion's share of the screen and serves eight different functions.

The primary screen includes a tactical display, acoustic conditions, sonar analysis, sonar identification, periscope video (a small onscreen window which offers the only visual contact with the target), database, weapons control, and torpedo defense.

Fortunately, MicroProse included a keyboard overlay in the package which greatly simplifies the process of selecting weapons, screens, and functions.

No one could ever say that *Red Storm Rising* is not a successful simulation. It is a magnificent recreation of high tech submarine warfare and a splendid translation of its source material. But fans of previous MicroProse efforts should be aware that this game requires a much greater commitment of time and energy than those earlier







Daily Double Horse Racing's *betting window (top left), race result (top right), and display of horses. (The program's full color screens are shown here in black and white.)*

simulations.

The rewards, however, are commensurate with the effort invested.

MicroProse, 180 Lake Front Dr., Hunt Valley, MD 21030 (phone: 301-771-1151). *—Bill Kunkel*

Circle #251 on Reader Service Card

DAILY DOUBLE HORSE RACING
Artworx
Commodore 64
Disk; $19.95

W. LaCroix's *Daily Double Horse Racing,* the first full-scale computer racetrack simulation, is a marvelous recreation of the racetrack experience that can be enjoyed by either a dilettante gambler or a hardnosed handicapper. I'm a lot closer to dilettante gambler than hard-nosed handicapper, and evaluated this simulation from that perspective.

In *Daily Double,* a good start really is half the race. My perception, after over a hundred heats, was that the horses who broke from the gate fastest seemed to stay ahead for the rest of the race. It seems that at least occasionally a front runner should drop out of contention, or a slow starter finish fast.

But that's a small quibble about an otherwise well-designed and intelligently executed product. Much of the game's data is stored in the excellent documentation, a tabloid-style mini-newspaper designed to resemble a traditional racing form. This includes complete information on the almost 200 available equines and the 12 jockeys who ride them.

Before the race begins, users visit the betting window and wager in the following categories: win, place, show, daily double (betting on two horses to win in two different races), exacta (picking the winning and placing horses in a race), quinella (picking two horses to finish first and second in a race in any order), and parlays (betting on two horses to both win, place, or show in any of the 10 races that comprise a day at the races).

To choose horses, the gamer selects an option which displays the horses running in each race. Each one is assigned a color prior to the race, to become the surrogate for one of 180 available ponies.

The bettor then scans the available information on the jockeys (number of races, finishing positions, and success based on track conditions), and considers the distance (from three to eight furlongs) and track status (turf, muddy or dry). Once this horsey wisdom is assimilated, it's time to place the bets. Finally, the program displays one of 376 prerecorded races from its memory bank. After each race, a scoreboard displays the three winners' names and how much they paid.

The graphics offer a scrolling grandstand perspective on the action. Designer/programmer LaCroix achieved a nice effect by breaking the background into three sections and moving each at a different speed. The only thing that's missing are quality audio effects. The thundering of hooves and the roar of the crowd would have added an extra dimension to the simulation. The sound effects included are very poor. The "thundering hooves" are represented by a monotonous clacking and there's no cheering at all until the race ends.

Daily Double Horse Racing could never be called state of the art software. But it's an intriguing look at the sport of kings, through a simulation that mimics many of the real-life trappings of the track.

Artworx, 1844 Penfield Rd., Penfield, NY 14526 (phone: 716-385-6120). *—Bill Kunkel*

Circle #252 on Reader Service Card

A QUESTION OF SCRUPLES
Leisure Genius
Commodore 64
Disk; $39.95

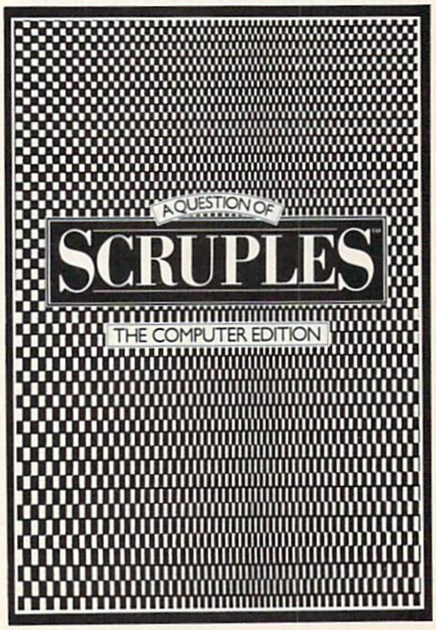
Milton Bradley's *Scruples* turned moral dilemmas into a family recreation, with a personality-revealing board game. It made the ability to judge character a game-winning strategy, by challenging players to estimate their opponents' moral fiber. Now this popular pastime has reached home microprocessors, thanks to an ingenius design by Sentient Software. *A Question of Scruples*, published by Virgin Games through their subsidiary, Leisure Genius, and distributed in the US by Electronic Arts, computerizes these kitchen-table conflicts, to turn the board game into a high-tech entertainment for up to 10 players.

Gamers are dealt electronic hands of Dilemma cards containing moral questions, plus an Answer card which reads Yes, No, or Depends. The object is to get rid of all the Dilemma cards. This is done by querying the person most likely to give the response that matches the Answer card in the player's hand.

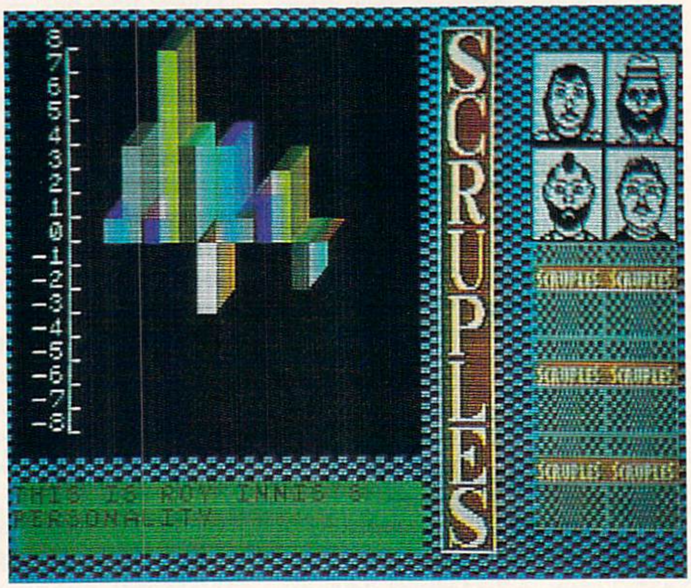
Successfully emptying a hand of playing cards requires judging the personality of an opponent, and guessing the reply that person will give to the question. The asker can challenge the reply, and then is offered a choice of answers from the remaining (unused) answers. The challenger selects a response; then all participants in the game vote on which answer they think correctly describes the respondent's personality. The winner in this straw poll gets to pass a Dilemma card from his or her hand to the defeated player.

The fun is in the conflict between players' visions (or pretenses) of their own character, and their image in others' (or the computer's) eyes. To establish personalities in this computer version, gamers build up bar charts with 12 individually set traits. Levels, set by moving the bar up and down with the joystick or keyboard controller, range from −8 (worst case) through 0 (about average) to +8 (highest possible). The personality traits are Principles, Personal Integrity, Professional Integrity, Trustworthiness, Family Relationship, Partner Relations, Friendships, Busy-body Factor, Humanity, Greed, Shyness, and Honesty.

After the human player enters his or her estimation of these traits, the on-screen bar chart is adjusted by the computer to conform interrelated traits. The







In the screen above, the computer combs **Scruples'** *face database for ones that suit the personalities described by bar charts like that at right.*

completed bar chart is then displayed for all the players to study for a few moments.

Next the computer combs its bank of faces for five that it deems best suit the personality described by the bar chart. The player moves a highlight box up and down over the possibilities, then presses the fire button to select one. This face is displayed throughout the game, on the right of the screen with the gallery of other players.

Up to ten players can compete, or as few as three, and these can be any combination of human and computerized opponents, even all human with the computer merely acting as monitor, or all computer players with the human as a spectator.

Onscreen prompts guide the play. At the beginning of each turn, the player's face is highlighted. A pointing hand is moved over to the Answer card which reads either Yes, No, or Depends. (In multihuman games, the other player must look away from the screen while the card is displayed.)

Then the player selects the question he or she wishes to pose, from the onscreen hand of Dilemma cards, and points to the onscreen face of the player to be asked. This person moves the hand up and down to select the answer; this elicits four choices of why they chose Yes, No, or Depends. If the response matches the Answer card in the Querant's hand, that Dilemma card is discarded, and a new Answer card is dealt for use in the next turn. Challenges can be issued whether or not the answers match, or by the other contestants even if the asking player doesn't want to use this option. The winner of the challenge, selected by vote or all the other players, gets to give away a Dilemma card.

The player who runs out of Dilemma cards first is declared the winner. Then the computer displays all the personality charts again, but this time adjusted by the answers given during the game to reveal a truer view of each player's character.

A database of over 230 Dilemma questions and 2750 answers keeps play fresh. But that takes second seat to the personalities of the computerized players, who range from saint to sinner. There are 64 characters, varying from Clergymen to Gangsters. Better still, these intelligent computer people have mood changes from game to game, so they behave as unpredictably as humans. They also show signs of pressure when they start to lose, and exhibit increased competitiveness until they get into control of the game again.

This is a remarkable translation of a family favorite. The personality charts, which help measure the honesty of each answer, are intriguing gauges. And, the varying personalities of the built-in opponents makes it possible to play the game over and over.

The onscreen graphics are workmanlike, though unspectacular. The animated players' faces, shown on the right-hand side of the screen, smile, grimace, wink, and behave like disembodied heads of playful wraiths throughout the game. Except for these faces, however, there isn't much visual enhancement.

The bar chart, too, is a good idea that doesn't quite work. Players build up these elaborate personality profiles, but they are only exhibited onscreen for three seconds at the beginning of the game. Only gamers with photographic memories can hope to gain much insight from this too brief flash of insight. The charts could have more influence on players' judgments of their opponents if they were available to view throughout the game.

Board games on computer suffer the lack of qualities that make them popular group pastimes. Play around the family table, with friends and loved ones in a social setting, always has



Platoon *has many virtues and one overwhelming flaw: an awkward play mechanic that is likely to cause most users to lay down their arms.*

more warmth and camaraderie than any micro can produce.

But, *A Question of Scruples* is a worthy entrant into the field of computer entertainment. It isn't too practical for play by large groups of humans (who would have to pass the joystick back and forth to enter responses, and turn their faces away to avoid seeing other players' cards). *A Question of Scruples* shines best in smaller circles. It's a nice entertainment for one or two humans working against the talented computerized opposition.

Leisure Genius, c/o Electronic Arts, 1820 Gateway Drive, San Mateo, CA (phone: 415-571-7171). *—Joyce Worley*

Circle #253 on Reader Service Card

PLATOON
Data East
Commodore 64
Disk; $39.95

There's a new field of study that should be required for all game designers: ergonomics. Ergonomics is not the name of Ronald Reagan's plan to stop inflation by giving rich people more money; ergonomics is the science and study of how objects interface with the people who use them.

Are the joystick ports on your computer impossible to access? Does that pen feel uncomfortable when you write? Are your VCR controls impossible to read without a flashlight? If so, these items were probably not subjected to ergonomic testing.

Neither was Data East's *Platoon*, a multiscenario combat game with many virtues and one overwhelming flaw: it was apparently designed to be played by an octopus.

Platoon is based on Oliver Stone's sensitive and successful film treatment of an innocent recruit's nightmarish odyssey through the crucible of the Vietnam war. The film deals with the struggle between good and evil, as epitomized by a pair of sergeants. Sgt. Elias, the platoon leader, represents man's struggle to maintain the ethics of civilization in the anarchy and violence of war. The malign Sgt. Barnes is the wolf in the fold, a character who revels in combat as a cover for his villainy.

Pretty heady stuff for a Data East shoot-em-up, yet an attempt was actually made to integrate some of these stirring elements from the original storyline into the game's continuity.

Platoon is divided into six scenarios: The Jungle, Village, Tunnel Network, Bunker, and Jungle again. The first two are basically the same with only a change of scenery. The player leads the platoon through the mazelike Southeast Asian jungle (represented by a series of neatly trimmed pathways—so much for realism!) in search of the village. There they scavenge through the huts for useful objects, and ultimately locate a trapdoor leading to the network of underground tunnels.

In the first place, the idea of a raw recruit taking a platoon into the jungle with no idea of where they're going immediately calls the game's credibility into question. This fearless leader has no map, compass, or radio. There aren't even hints provided about where the platoon is supposed to be heading. Instead, the soldiers simply blunder about the jungle, besieged on all sides, hoping to eventually stumble on the villain.

If the player remains for more than a second in any one spot, a V.C. leaps

from the trees and kills him. There are also hard-to-spot trip wires which, if detonated, are lethal. Otherwise, each platoon member can survive three gunshot wounds. There are also trapdoors which open right in front of the soldier and instantly gun him down.

There are problems with the manner in which the platoon is deployed: one at a time. Every time a soldier is shot or killed, a window appears with an update on the status of each of the five platoon members. The player can select that same player, if he's still alive, or choose another.

This would be fine if the program discriminated among the five men. For example, it would be nice if they carried different weapons, moved at varying speeds and/or varied in their vulnerability to gunfire. However, these differences don't exist; the soldiers are identical. This sort of play device implies that the game is offering the player viable strategic options, but it is not. If soldiers were simply revived automatically until each collected four wounds, it wouldn't make the slightest difference to the game's play.

The first two scenarios employ a three-quarters perspective with the player able to periodically move north or south to a parallel pathway.

There is a crucial problem with this game's interface. The onscreen soldiers can walk left or right, duck, jump (straight up, left or right, though the instructions neglect to mention the latter two options), shoot, and throw grenades. Unfortunately, the designers (Ocean Software) chose to initiate the grenade-throwing by having the player hit the space bar.

These mini action games are rendered all but unplayable by this need to use the space bar. The user must hold the joystick right above the keyboard to be able to hit the bar at a nanosecond's notice (which is about how long the player has between the time a trapdoor opens and its occupants open fire).

This awkward play mechanic makes a difficult game virtually impossible, and most users will lay down their arms (and the joystick) long before they ever reach the village or the tunnels.

If the player does locate and enter the tunnels, the game improves greatly. The graphics change to first person perspective, and add a crosshair. The player uses the joystick to move through the tunnels until an enemy appears. Movement ceases at this point and control is assigned to the onscreen crosshairs. While in the Tunnel, the player can locate flares and a compass (apparently the U.S. Army doesn't provide compasses, preferring troops to scrounge for them). These are needed in order to play the next mini game.

The first person viewpoint continues as the player emerges from the tunnels into a foxhole, inexplicably called The Bunker, from which he must shoot down attacking Viet Cong.

If the user survives a harrowing night in the foxhole, he then goes off in search of Sgt. Elias. Before the second Jungle game gets going, the player encounters the evil Sgt. Barnes who tells him Elias is dead. Once the game engages, however, an overhead perspective shows the player attempting to move north through a V.C. gauntlet. Sgt. Elias surprisingly appears and is killed by a burst of gunfire. "A little bit more of your innocence and sanity is eroded," the instructions explain, but if you've survived the first two scenarios, you've probably already lost any trace of sanity.

At this point, the player gets a message over the radio (where this radio comes from and why it hasn't been used before is another of *Platoon's* many imponderables). This broadcast informs him that an air strike is about to turn his present locale into an open air barbeque pit and he has only minutes to get to safety.

But first, of course, comes the showdown with Barnes in the game's ultimate scenario. The play mechanic here harkens back to the first two mini-games, with all the accompanying problems.

Platoon constitutes Data East's most ambitious entry yet into the computer software market. The graphics are nice enough, and there's a lot of game value here. *Platoon* is an interesting attempt to recreate some of the sensibilities along with the thrills of the movie. Unfortunately, its success is largely sabotaged by an awkward play mechanic.

Data East, 470 Needles Dr., San Jose, CA 95112 (phone: 408-286-7074).

–Bill Kunkel

Circle #254 on Reader Service Card

TOWER TOPPLER
U.S. Gold/Epyx
Commodore 64
Disk; $39.95

Tower Toppler challenges the player, an employee of Destructo, Inc., Intergalactic planet wreckers, to topple the eight mysterious towers that sit amidst the toxic ocean which comprises the entire planet Nebulus. The only way to bring down these towers is to climb them, and this is not easy.

The towers can only be scaled from the outside, where a network of walkways, stairs, and elevators provide access to the summit. It's not quite so easy and straightforward, however; there are obstacles and guardians along the way. There's also a preset time limit and the tower must be scaled before it expires, or the player-character does.

Some of the obstacles can be eliminated by a blast from the player's zap gun, but others are indestructible and must be avoided or circumvented, as

Continued on page 73

PROGRAM LISTINGS

Attention new *Ahoy!* readers! You must read the following information very carefully prior to typing in programs listed in *Ahoy!* Certain Commodore characters, commands, and strings of characters and commands will appear in a special format. Follow the instructions and listings guide on this page.

On the following pages you'll find several programs that you can enter on your Commodore computer. But before doing so, read this entire page carefully.

To insure clear reproductions, *Ahoy!'s* program listings are generated on a daisy wheel printer, incapable of printing the commands and graphic characters used in Commodore programs. These are therefore represented by various codes enclosed in brackets [ ]. For example: the SHIFT CLR/HOME command is represented onscreen by a heart ♥. The code we use in our listings is [CLEAR]. The chart below lists all such codes which you'll encounter in our listings, except for one other special case.

The other special case is the COMMODORE and SHIFT characters. On the front of most keys are two symbols. The symbol on the left is obtained by pressing that key while holding down the COMMODORE key; the symbol on the right, by pressing that key while holding down the SHIFT key. COMMODORE and SHIFT characters are represented in our listings by a lower-case "s" or "c" followed by the symbol of the key you must hit. COMMODORE J, for example, is represented by [c J], and SHIFT J by [s J].

Additionally, any character that occurs more than two times in a row will be displayed by a coded listing. For example, [3 "[LEFT]"] would be 3 CuRSoR left commands in a row, [5 "[s EP]"] would be 5 SHIFTed English Pounds, and so on. Multiple blank spaces will be noted in similar fashion: e.g., 22 spaces as [22 " "].

Sometimes you'll find a program line that's too long for the computer to accept (C-64 lines are a maximum of 80 characters, or 2 screen lines long; C-128 lines, a maximum of 160 characters, 2 or 4 screen lines in 40 or 80 columns respectively). To enter these lines, refer to the *BASIC Command Abbreviations Appendix* in your User Manual.

On the next page you'll find our *Bug Repellent* programs for the C-128 and C-64. The version for your machine will help you proofread programs after typing them. (Please note: the *Bug Repellent* line codes that follow each program line, in the whited-out area, should *not* be typed in. See instructions preceding each program.)

On the second page following you will find *Flankspeed*, our ML entry program, and instructions on its use.

Call *Ahoy!* at 212-239-6089 with any problems (if busy or no answer after three rings, call 212-239-0855).

WHEN YOU SEE	IT MEANS	YOU TYPE		YOU WILL SEE
[CLEAR]	Screen Clear	SHIFT	CLR/HOME	
[HOME]	Home		CLR/HOME	
[UP]	Cursor Up	SHIFT	↑ CRSR ↓	
[DOWN]	Cursor Down		↑ CRSR ↓	
[LEFT]	Cursor Left	SHIFT	← CRSR →	
[RIGHT]	Cursor Right		← CRSR →	
[SS]	Shifted Space	SHIFT	Space	
[INSERT]	Insert	SHIFT	INST/DEL	
[DEL]	Delete		INST/DEL	
[RVSON]	Reverse On	CNTRL	9	
[RVSOFF]	Reverse Off	CNTRL	0	
[UPARROW]	Up Arrow		↑	↑
[BACKARROW]	Back Arrow		←	←
[PI]	PI		π	π
[EP]	English Pound		£	£

WHEN YOU SEE	IT MEANS	YOU TYPE		YOU WILL SEE
[BLACK]	Black	CNTRL	1	
[WHITE]	White	CNTRL	2	
[RED]	Red	CNTRL	3	
[CYAN]	Cyan	CNTRL	4	
[PURPLE]	Purple	CNTRL	5	
[GREEN]	Green	CNTRL	6	
[BLUE]	Blue	CNTRL	7	
[YELLOW]	Yellow	CNTRL	8	
[F1]	Function 1		F1	
[F2]	Function 2	SHIFT	F1	
[F3]	Function 3		F3	
[F4]	Function 4	SHIFT	F3	
[F5]	Function 5		F5	
[F6]	Function 6	SHIFT	F5	
[F7]	Function 7		F7	
[F8]	Function 8	SHIFT	F7	

BUG REPELLENT FOR THE 64 & 128 By BUCK CHILDRESS

Please note: the *Bug Repellent* programs listed here are for *Ahoy!* programs published from the May 1987 issue onward! For older programs, use the older version.

Type in, save, and run *Bug Repellent.* You'll be asked if you want automatic saves to take place. If so, you're prompted for the device, DISK (D) or TAPE (T). You then pick a starting file number, 0 through 99. Next, you enter a name, up to 14 characters long. At this point, *Bug Repellent* verifies your entries and gives you a chance to change them if you want. If no changes are needed, *Bug Repellent* activates itself. (Pressing RETURN without answering the prompts defaults to disk drive and begins your files with "00BACKUP".)

Type NEW and begin entering an *Ahoy!* program. As you enter program lines and press RETURN, a *Bug Repellent* code appears at the top of your screen. If it doesn't match the code in the program listing, an error exists. Correct the line and the codes will match.

If used, automatic saves take place every 15 minutes. When the RETURN key is pressed on a program line, the screen changes color to let you know that a save will begin in about three seconds. You may cancel the save by pressing the RUN STOP key. The file number increments after each save. It resets to 00 if 99 is surpassed. After saving, or cancelling, the screen returns to its original color and the timer resets for 15 minutes.

When you've finished using *Bug Repellent*, deactivate it by typing SYS 49152 [RETURN] for the Commodore 64 or SYS 4864 [RETURN] for the Commodore 128.

C-64 BUG REPELLENT

```
·10 PRINTCHR$(147)"LOADING AND CHECKING THE DATA[3"."]":J
=49152
·20 FORB=0TO11:READA:IFA<0ORA>255THEN40
·30 POKEJ+B,A:X=X+A:NEXTB:READA:IFA=XTHEN50
·40 PRINT:PRINT"ERROR IN DATA LINE:"PEEK(64)*256+PEEK(63)
:END
·50 X=0:J=J+12:IFJ<49456THEN20
·60 POKE198,0:POKE49456,0:A$="Y":B$=A$:C$="D":D$="DISK":D
=8:PRINTCHR$(147)
·70 INPUT"DO YOU WANT AUTOMATIC SAVES (Y/N)";A$:PRINT:IFA
$="Y"THEN90
·80 PRINT"NO AUTOMATIC SAVES[3"."]":GOTO150
·90 POKE49456,1:INPUT"DISK OR TAPE (D/T)";C$:IFC$<>"D"THE
ND=1:D$="TAPE"
·100 POKE49457,D:D$=D$+" DRIVE":PRINT:INPUT"FILE NUMBER (
0-99)";N
·110 N$=RIGHT$(STR$(N),2):IFN<10THENN$=CHR$(48)+CHR$(N+48
)
·120 F$="BACKUP":PRINT:INPUT"FILENAME";F$:F$=N$+LEFT$(F$,
14):L=LEN(F$)
·130 POKE49458,L:FORJ=1TOL:POKE49458+J,ASC(MID$(F$,J,1)):
NEXTJ:PRINT
·140 PRINT"SAVING DEVICE ** "D$:PRINT"STARTING WITH ** "F
$
·150 PRINT:INPUT"IS THIS CORRECT (Y/N)";B$:IFB$<>"Y"THEN6
0
·160 POKE770,131:POKE771,164:SYS49152:END
·170 DATA169,79,32,210,255,162,38,160,192,204,3,3,1507
·180 DATA208,10,162,131,160,164,169,70,32,210,255,44,1615
·190 DATA169,78,32,210,255,142,2,3,140,3,3,76,1113
·200 DATA36,193,32,96,165,134,122,132,123,32,115,0,1180
·210 DATA170,240,243,162,255,134,58,144,3,76,150,164,1799
·220 DATA32,107,169,32,121,165,173,0,2,240,5,169,1215
·230 DATA79,141,2,3,76,162,164,169,0,133,2,133,1064
·240 DATA251,133,252,133,254,24,101,20,69,254,230,254,197
5
·250 DATA24,101;21,69,254,170,230,254,164,252,185,0,1724
·260 DATA2,133,253,201,34,208,6,165,2,73,255,133,1465
·270 DATA2,201,32,208,4,165,2,240,8,138,24,101,1125
·280 DATA253,69,254,170,44,198,254,230,252,164,253,208,23
49
·290 DATA213,138,41,240,74,74,74,74,24,105,129,141,1327
·300 DATA44,193,138,41,15,24,105,129,141,45,193,162,1230
·310 DATA0,189,43,193,240,12,157,0,4,173,134,2,1147
·320 DATA157,0,216,232,208,239,169,38,141,2,3,173,1578
·330 DATA48,193,240,23,165,161,201,212,176,4,165,160,1748
·340 DATA240,13,238,32,208,160,0,32,225,255,208,6,1617
·350 DATA32,33,193,76,38,192,232,208,242,200,208,239,1893
·360 DATA32,68,229,169,0,168,174,49,193,32,186,255,1555
·370 DATA173,50,193,162,51,160,193,32,189,255,169,43,1670
·380 DATA166,45,164,46,32,216,255,162,1,189,51,193,1520
·390 DATA168,200,152,201,58,144,2,169,48,157,51,193,1543
·400 DATA201,48,208,3,202,16,234,32,33,193,76,116,1362
·410 DATA164,206,32,208,169,0,170,168,76,219,255,160,1827
·420 DATA1,1,160,0,0,65,72,79,89,33,0,0,500
```

C-128 BUG REPELLENT

```
·10 PRINTCHR$(147)"LOADING AND CHECKING THE DATA[3"."]":J
=4864
·20 FORB=0TO11:READA:IFA<0ORA>255THEN40
·30 POKEJ+B,A:X=X+A:NEXTB:READA:IFA=XTHEN50
·40 PRINT:PRINT"ERROR IN DATA LINE:"PEEK(66)*256+PEEK(65)
:END
·50 X=0:J=J+12:IFJ<5213THEN20
·60 POKE208,0:POKE5213,0:A$="Y":B$=A$:C$="D":D$="DISK":D=
8:PRINTCHR$(147)
·70 INPUT"DO YOU WANT AUTOMATIC SAVES (Y/N)";A$:PRINT:IFA
$="Y"THEN90
·80 PRINT"NO AUTOMATIC SAVES[3"."]":GOTO150
·90 POKE5213,1:INPUT"DISK OR TAPE (D/T)";C$:IFC$<>"D"THEN
D=1:D$="TAPE"
·100 POKE5214,D:D$=D$+" DRIVE":PRINT:INPUT"FILE NUMBER (0
-99)";N
·110 N$=RIGHT$(STR$(N),2):IFN<10THENN$=CHR$(48)+CHR$(N+48
)
·120 F$="BACKUP":PRINT:INPUT"FILENAME";F$:F$=N$+LEFT$(F$,
14):L=LEN(F$)
·130 POKE5215,L:FORJ=1TOL:POKE5215+J,ASC(MID$(F$,J,1)):NE
XTJ:PRINT
·140 PRINT"SAVING DEVICE ** "D$:PRINT"STARTING WITH ** "F
$
·150 PRINT:INPUT"IS THIS CORRECT (Y/N)";B$:IFB$<>"Y"THEN6
0
·160 POKE770,198:POKE771,77:SYS4864:END
·170 DATA32,58,20,169,41,162,19,236,3,3,208,4,955
·180 DATA169,198,162,77,141,2,3,142,3,3,224,19,1143
·190 DATA208,7,32,125,255,79,78,0,96,32,125,255,1292
·200 DATA79,70,70,0,96,162,0,134,251,189,0,2,1053
·210 DATA240,19,201,48,144,9,201,58,176,5,133,251,1485
·220 DATA232,208,238,134,252,165,251,208,3,76,198,77,2042
·230 DATA169,0,166,235,164,236,133,253,133,254,142,47,193
2
·240 DATA20,140,48,20,24,101,22,69,254,230,254,24,1206
·250 DATA101,23,69,254,170,230,254,164,252,185,0,2,1704
·260 DATA133,251,201,34,208,6,165,253,73,255,133,253,1965
·270 DATA201,32,208,4,165,253,240,8,138,24,101,251,1625
·280 DATA69,254,170,44,198,254,230,252,164,251,208,213,23
07
·290 DATA138,41,240,74,74,74,74,24,105,65,141,88,1138
·300 DATA20,138,41,15,24,105,65,141,89,20,32,79,769
·310 DATA20,189,85,20,240,6,32,210,255,232,208,245,1742
·320 DATA174,47,20,172,48,20,24,32,240,255,173,93,1298
·330 DATA20,240,27,165,161,201,212,176,4,165,160,240,1771
·340 DATA17,32,65,20,238,32,208,238,1,214,32,225,1322
·350 DATA255,208,6,32,49,20,76,198,77,232,208,242,1603
·360 DATA200,208,239,32,66,193,173,95,20,162,96,160,1644
·370 DATA20,32,189,255,169,0,170,32,104,255,169,0,1395
·380 DATA174,94,20,168,32,186,255,169,45,174,16,18,1351
·390 DATA172,17,18,32,216,255,162,1,189,96,20,168,1346
·400 DATA200,152,201,58,144,2,169,48,157,96,20,201,1448
·410 DATA48,208,3,202,16,234,32,49,20,141,0,2,955
·420 DATA76,183,77,58,59,32,65,20,206,32,208,206,1222
·430 DATA1,214,169,0,170,168,76,219,255,32,79,20,1403
·440 DATA169,26,141,0,214,173,0,214,16,251,96,162,1462
·450 DATA0,142,0,255,96,19,18,32,32,32,32,146,804
·460 DATA0,1,0,0,65,72,79,89,33,0,0,0,339
```

FLANKSPEED FOR THE C-64 By GORDON F. WHEAT

Flankspeed will allow you to enter machine language *Ahoy!* programs without any mistakes. Once you have typed the program in, save it for future use. While entering an ML program with *Flankspeed* there is no need to enter spaces or hit the carriage return. This is all done automatically. If you make an error in a line a bell will ring and you will be asked to enter it again. To LOAD in a program Saved with *Flankspeed* use LOAD "name",1,1 for tape, or LOAD "name",8,1 for disk. The function keys may be used after the starting and ending addresses have been entered.

f1–SAVEs what you have entered so far.

f3–LOADs in a program worked on previously.

f5–To continue on a line you stopped on after LOADing in the previous saved work.

f7–Scans through the program to locate a particular line, or to find out where you stopped the last time you entered the program. It temporarily freezes the output as well.

```
·100 POKE53280,12:POKE53281,11                                OP
·105 PRINT"[CLEAR][c 8][RVSON][15" "]FLANKSPEED[15" "]";      FP
·110 PRINT"[RVSON][5" "]MISTAKEPROOF ML ENTRY PROGRAM[6" "
 ]"                                                           JP
·115 PRINT"[RVSON][9" "]CREATED BY G. F. WHEAT[9" "]"         FA
·120 PRINT"[RVSON][3" "]COPR. 1987, ION INTERNATIONAL INC.
 [3" "]"                                                      AJ
·125 FORA=54272TO54296:POKEA,0:NEXT                           ND
·130 POKE54272,4:POKE54273,48:POKE54277,0:POKE54278,249:PO
 KE54296,15                                                   NP
·135 FORA=680TO699:READB:POKEA,B:NEXT                         FL
·140 DATA169,251,166,253,164,254,32,216,255,96                FF
·145 DATA169,0,166,251,164,252,32,213,255,96                  EK
·150 B$="STARTING ADDRESS IN HEX":GOSUB430:AD=B:SR=B          KP
·155 GOSUB480:IFB=0THEN150                                    OE
·160 POKE251,T(4)+T(3)*16:POKE252,T(2)+T(1)*16                AM
·165 B$="ENDING ADDRESS IN HEX":GOSUB430:EN=B                 PE
·170 GOSUB470:IFB=0THEN150                                    PG
·175 POKE254,T(2)+T(1)*16:B=T(4)+1+T(3)*16                    GM
·180 IFB>255THENB=B-255:POKE254,PEEK(254)+1                   HG
·185 POKE253,B:PRINT                                          EC
·190 REM  GET HEX LINE                                        ED
·195 GOSUB495:PRINT": [c P][LEFT]";:FORA=0TO8                 KD
·200 FORB=0TO1:GOTO250                                        IH
·205 NEXTB                                                    IJ
·210 A%(A)=T(1)+T(0)*16:IFAD+A-1=ENTHEN340                    FA
·215 PRINT" [c P][LEFT]";                                     EG
·220 NEXTA:T=AD-(INT(AD/256)*256):PRINT" "                    II
·225 FORA=0TO7:T=T+A%(A):IFT>255THENT=T-255                   GL
·230 NEXT                                                     GI
·235 IFA%(8)<>TTHENGOSUB375:GOTO195                           FL
·240 FORA=0TO7:POKEAD+A,A%(A):NEXT:AD=AD+8:GOTO195            IM
·245 REM    GET HEX INPUT                                     PA
·250 GETA$:IFA$=""THEN250                                     GA
·255 IFA$=CHR$(20)THEN305                                     GO
·260 IFA$=CHR$(133)THEN535                                    LM
·265 IFA$=CHR$(134)THEN560                                    IG
·270 IFA$=CHR$(135)THENPRINT" ":GOTO620                       HO
·275 IFA$=CHR$(136)THENPRINT" ":GOTO635                       HE
·280 IFA$>"@"ANDA$<"G"THENT(B)=ASC(A$)-55:GOTO295             MI
·285 IFA$>"/"ANDA$<":"THENT(B)=ASC(A$)-48:GOTO295             DJ
·290 GOSUB415:GOTO250                                         JA
·295 PRINTA$"[c P][LEFT]";                                    PK
·300 GOTO205                                                  FA
·305 IFA>0THEN320                                             BI
·310 A=-1:IFB=1THEN330                                        BB
·315 GOTO220                                                  FA
·320 IFB=0THENPRINTCHR$(20);CHR$(20);:A=A-1                   BF
·325 A=A-1                                                    FK
·330 PRINTCHR$(20);:GOTO220                                   PH
·335 REM LAST LINE                                            CP
·340 PRINT" ":T=AD-(INT(AD/256)*256)                          KH
·345 FORB=0TOA-1:T=T+A%(B):IFT>255THENT=T-255                 OD
·350 NEXT                                                     OB
·355 IFA%(A)<>TTHENGOSUB375:GOTO195                           LH
·360 FORB=0TOA-1:POKEAD+B,A%(B):NEXT                          BO
·365 PRINT:PRINT"YOU ARE FINISHED!":GOTO535                   MB
·370 REM BELL AND ERROR MESSAGES                              LM
·375 PRINT:PRINT"LINE ENTERED INCORRECTLY":PRINT:GOTO415      JK
·380 PRINT:PRINT"INPUT A 4 DIGIT HEX VALUE!":GOTO415          PG
·385 PRINT:PRINT"ENDING IS LESS THAN STARTING!":B=0:GOTO41
 5                                                            IK
·390 PRINT:PRINT"ADDRESS NOT WITHIN SPECIFIED RANGE!":B=0:
 GOTO415                                                      HK
·395 PRINT:PRINT"NOT ZERO PAGE OR ROM!":B=0:GOTO415           DM
·400 PRINT"?ERROR IN SAVE":GOTO415                            JK
·405 PRINT"?ERROR IN LOAD":GOTO415                            IO
·410 PRINT:PRINT:PRINT"END OF ML AREA":PRINT                  JO
·415 POKE54276,17:POKE54276,16:RETURN                         BF
·420 OPEN15,8,15:INPUT#15,A,A$:CLOSE15:PRINTA$:RETURN         DH
·425 REM GET FOUR DIGIT HEX                                   IM
·430 PRINT:PRINTB$;:INPUTT$                                   OL
·435 IFLEN(T$)<>4THENGOSUB380:GOTO430                         JD
·440 FORA=1TO4:A$=MID$(T$,A,1):GOSUB450:IFT(A)=16THENGOSUB
 380:GOTO430                                                  AK
·445 NEXT:B=(T(1)*4096)+(T(2)*256)+(T(3)*16)+T(4):RETURN      KB
·450 IFA$>"@"ANDA$<"G"THENT(A)=ASC(A$)-55:RETURN              GM
·455 IFA$>"/"ANDA$<":"THENT(A)=ASC(A$)-48:RETURN              NJ
·460 T(A)=16:RETURN                                           IC
·465 REM ADDRESS CHECK                                        OL
·470 IFAD>ENTHEN385                                           HO
·475 IFB<SRORB>ENTHEN390                                      LE
·480 IFB<256OR(B>40960ANDB<49152)ORB>53247THEN395             OB
·485 RETURN                                                   HE
·490 REM ADDRESS TO HEX                                       PM
·495 AC=AD:A=4096:GOSUB520                                    AP
·500 A=256:GOSUB520                                           NF
·505 A=16:GOSUB520                                            LG
·510 A=1:GOSUB520                                             HE
·515 RETURN                                                   JD
·520 T=INT(AC/A):IFT>9THENA$=CHR$(T+55):GOTO530               OC
·525 A$=CHR$(T+48)                                            JI
·530 PRINTA$;:AC=AC-A*T:RETURN                                AA
·535 A$="**SAVE**":GOSUB585                                   IC
·540 OPEN1,T,1,A$:SYS680:CLOSE1                               AB
·545 IFST=0THENEND                                            FB
·550 GOSUB400:IFT=8THENGOSUB420                               PM
·555 GOTO535                                                  FI
·560 A$="**LOAD**":GOSUB585                                   PE
·565 OPEN1,T,0,A$:SYS690:CLOSE1                               PO
·570 IFST=64THEN195                                           OI
·575 GOSUB405:IFT=8THENGOSUB420                               CO
·580 GOTO560                                                  GN
·585 PRINT" ":PRINTTAB(14)A$                                  KA
·590 PRINT:A$="":INPUT"FILENAME";A$                           IO
·595 IFA$=""THEN590                                           HK
·600 PRINT:PRINT"TAPE OR DISK?":PRINT                         HL
·605 GETB$:T=1:IFB$="D"THENT=8:A$="@0:"+A$:RETURN             NP
·610 IFB$<>"T"THEN605                                         KO
·615 RETURN                                                   PH
·620 B$="CONTINUE FROM ADDRESS":GOSUB430:AD=B                 DD
·625 GOSUB475:IFB=0THEN620                                    NK
·630 PRINT:GOTO195                                            HN
·635 B$="BEGIN SCAN AT ADDRESS":GOSUB430:AD=B                 FK
·640 GOSUB475:IFB=0THEN635                                    LN
·645 PRINT:GOTO670                                            HI
·650 FORB=0TO7:AC=PEEK(AD+B):GOSUB505:IFAD+B=ENTHENAD=SR:G
 OSUB410:GOTO195                                              LM
·655 PRINT" ";:NEXTB                                          LE
·660 PRINT:AD=AD+8                                            CD
·665 GETB$:IFB$=CHR$(136)THEN195                              JD
·670 GOSUB495:PRINT": ";:GOTO650                              KE
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VANISH
FROM PAGE 45

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•10 FAST:FORA=1TO2:FORR=1TO4:FORC=1TO4:RE
ADAN(A,R,C):NEXTC,R,A                          EE
•12 FORT=1TO4:READLO(T),HI(T):NEXT:TS=588
9                                              HC
•14 FORT=0TO1068:READX$:POKE4864+T,DEC(X$
):NEXT:FORT=0TO511:READX$:POKE3584+T,DEC
(X$):NEXT                                      JK
•16 FAST:FA=250:FB=251:FC=252:FD=253:TEM=
DEC("14CD"):LO=DEC("1395"):HI=LO+1:P1=28
16:P2=P1+1:C(1)=3:C(2)=7:S(1)=0:S(2)=0:E
Y=49176:GP=GP+1:X8=184:Y8=55:W1=0              CA
•18 FORT=1TO2:LR(T)=1:LC(T)=1:NEXT:BL$=""
:FORT=0TO7:BL$=BL$+" ":NEXT                    PK
•20 PX(1)=31:PX(2)=0:PY(1)=8:PY(2)=8:YW$(
1)="  ROW  ":YW$(2)=" COLUMN "                 IM
•22 CT$(1)="PLAYER CONTROLLED":CT$(2)="CO
MPUTER CONTROLLED"                             CO
•24 SP$(1)="HIGHWAY TRAFFIC":SP$(2)="SPEE
D OF SOUND":SP$(3)="SPEED OF LIGHT"            LK
•26 TG$(1)="AMATEUR":TG$(2)="SEMI-PRO":TG
$(3)="PROFESSIONAL"                            BH
•28 P$(1)="THE RED FORCE":P$(2)="THE BLUE
 FORCE"                                        NJ
•30 REM ** MAKE GAME SELECTIONS **             LL
•32 SLOW:COLOR4,2:COLOR0,2:GRAPHIC0,1:PRI
NTTAB(9)"[BLACK][RVSON] CONTROL  SELECTI
ON [DOWN]":FORT=1TO2:PRINTTAB(7)"[RED]"T
"[5"."]"CT$(T)"[DOWN]":NEXT:GOSUB46            AF
•34 GETKEYY$:CU=VAL(Y$):IFCU=0THENCT=2:EL
SECT=CU                                        NC
•36 SYSEY,0,7,9:PRINT"[RVSON][BLACK] PROJ
ECTILE'S  SPEED [DOWN]":FORT=1TO3:PRINTT
AB(7)"[GREEN]"T"[5"."]"SP$(T)"[DOWN]":NE
XT:GOSUB46                                     CK
•38 GETKEYY$:CU=VAL(Y$):IFCU=0THENSP=2:EL
SESP=CU                                        FO
•40 SYSEY,0,16,9:PRINT"[RVSON][BLACK] SKI
LL LEVEL OF PLAY [DOWN]":FORT=1TO3:PRINT
TAB(7)"[BLUE]"T"[5"."]"TG$(T)"[DOWN]":NE
XT:GOSUB46                                     HL
•42 GETKEYY$:CU=VAL(Y$):IFCU=0THENTG=1:EL
SETG=CU                                        NL
•44 POKEDEC("1470"),-(TG=3):GOTO48             DA
•46 SOUND1,1400,30:RETURN                      IO
•48 FAST:COLOR4,1:COLOR0,1:GRAPHIC1,1          GD
•50 IFTG=2THENFORT=0TO1:POKE8190+T,59:NEX
T                                              IA
•52 REM ** DRAW PLAYING GRID **                LO
•54 C=0:FORA=0TO179STEP179:C=C+1:COLOR1,C
(C)                                            BM
•56 DRAW1,A,160TO140+A,160TO100+A,97TO40+
A,97TO0+A,160:PAINT1,50+A,140:NEXT:SLOW        CG
•58 FORU=0TO179STEP179:FORT=1TO3               DN
•60 DRAW0,34*T+U,160TO15*T+40+U,97:NEXTT,
U                                              JD
•62 U=5:U1=0:COLOR1,2:CHAR1,14,0," V A N
I S H ",1                                      MP
•64 DRAW0,0,99+UTO319,99+U                     GO
•66 U1=U1+10:U=U+U1:IFU<36THEN64               AP
•68 FORT=0TO1:MOVSPRT+7,0#0:MOVSPRT+7,179
*T+85,145:SPRITET+7,1,2,0:NEXT                 BO
•70 IFCT=2THEN76                               FF
•72 COLOR1,12:CHAR1,18,10,"ROW":FORT=0TO2
:CHAR1,18,11+2[UPARROW]T,STR$(T+1):NEXT:
CHAR1,19,18,"4"                                CN
•74 COLOR1,11:CHAR1,2,22,"4[3" "]3[3" "]2
[3" "]1":COLOR1,15:CHAR1,24,22,"1[3" "]2
[3" "]3[3" "]4":COLOR1,5:CHAR1,15,23," C
OLUMNS ",1                                     PK
•76 POKE8184,63:MOVSPR1,0#0:MOVSPR1,184,6
0:SPRITE1,1,6,0:SLOW                           FF
•78 REM ** ALTERNATE PLAYER **                 MH
•80 N=1-(N=1):M=1-(N=1)                        HM
•82 POKEFC,0:POKEP1,0:POKEP2,0:POKE4943,-
(N=1):POKE4950,-(N=1):CHAR1,0,8,BL$:CHAR
1,31,8,BL$:SYSTEM                              JC
•84 REM ** COMPUTER SELECTS PROJECTILE'S
DESTINATION **                                 DL
•86 GOSUB136:IFW1THEN146                       BB
•88 IFCT=2THENYR(M)=INT(RND(1)*4)+1:YC(M)
=INT(RND(1)*4)+1:IFQ(M,YR(M),YC(M))=GPTH
EN88                                           GN
•90 IFCT=2THEN114                              JL
•92 YR(M)=LR(M):YC(M)=LC(M):GOSUB112:YS=1
:GOSUB108                                      FA
•94 REM ** PLAYER SELECTS PROJECTILE'S DE
STINATION **                                   GK
•96 JN=JOY(M):GOSUB136:IFW1THEN146:ELSEIF
JN=128THENGOTO104                              CP
•98 IFJN/2=INT(JN/2)ORJN<129THEN96             CF
•100 YS=YS+1:GOSUB108:IFYS=2THENYR(M)=(JN
-127)/2:LR(M)=YR(M):GOTO96                     MF
•102 IFYS=3THENYC(M)=(JN-127)/2:LC(M)=YC(
M):GOTO114                                     GN
•104 YS=YS+1:GOSUB108:IFYS=2THENYR(M)=LR(
M):GOTO96                                      IA
•106 IFYS=3THENYC(M)=LC(M):GOSUB112:GOTO1
14                                             DL
•108 COLOR1,8:CHAR1,PX(M),PY(M),YW$(YS),1
:SOUND3,40000,1:IFYS<3THENSLEEP1               CG
•110 RETURN                                    PM
•112 COLOR1,8:CHAR1,0,8,BL$:SOUND3,8000,1
0:CHAR1,31,8,BL$:RETURN                        EH
•114 OL=INT(RND(1)*YR(M))*3:POKELO,LO(YR(
M))+OL:POKEHI,HI(YR(M))+OL:A=AN(M,YR(M),
YC(M)):FORT=0TO3:POKET+FA,0:NEXT               GD
•116 REM ** MOVE PROJECTILE TO TAKE OFF P
OINT,FIRE IT **                                PI
•118 SOUND3,8000,60,1,200,105,3:MOVSPR1,0
```

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#0:MOVSPR1,X8,Y8:SPRITE1,1,6,0,0,0:MOVSP
R1,A#SP                                              FJ
·120 REM ** RUNNING CHECK ON INTERACTIONS
 **                                                  EF
·122 GOSUB136:IFW1THEN146                            DN
·124 IFPEEK(FA)THENSOUND1,5000,10:GOTO76             DB
·126 IFPEEK(FB)THENSOUND1,15000,10:GOTO76            FH
·128 IFPEEK(FD)THENSOUND3,500,30:PAINT0,R
SPPOS(1,0)-24,RSPPOS(1,1)-50:GOSUB142:S(
M)=S(M)+1:Q(M,YR(M),YC(M))=GP:GOTO82                 MO
·130 IFRSPPOS(1,1)>240THENMOVSPR1,0#0:MOV
SPR1,X8,Y8:GOTO80                                    MO
·132 GOTO122                                         KF
·134 REM ** CHECK IF PLAYER HAS LOST **              CB
·136 IFPEEK(P1)ORS(1)=15THENW1=2:L1=7                AA
·138 IFPEEK(P2)ORS(2)=15THENW1=1:L1=8                CM
·140 RETURN                                          BK
·142 MOVSPR1,0#0:MOVSPR1,184,60:SPRITE1,1
,6,0:RETURN                                          LH
·144 REM ** WIN ROUTINE **                           AG
·146 COLOR1,C(W1):CHAR1,6,4,"THE WINNER I
S "+P$(W1):SOUND1,5000,120,1,300,37,0:SP
RITEL1,1,2,1:MOVSPRL1,180#1:POKE53269,19
2                                                    KM
·148 CHAR1,7,6,"PRESS '*' KEY FOR NEW GAM
E"                                                   LA
·150 IFRSPPOS(L1,1)>245THENSPRITEL1,0                CB
·152 REM ** NEW GAME SELECTION **                    KB
·154 GETY$:IFY$<>"*"THEN150:ELSEFAST:GOTO
16                                                   CA
·156 REM ** DATA FOR LIMITS AND ANGLES **            DC
·158 DATA 215,222,227,231,212,219,225,229
,206,215,222,227,200,210,218,225                     IE
·160 DATA 146,139,134,129,151,142,137,132
,156,146,139,133,162,152,144,135                     OB
·162 DATA 147,152,156,162,166,171,187,192            AF
·164 REM **  DATA FOR ML ROUTINES  **                BE
·166 DATA DE,E3,11,60,FE,E3,11,60,AD,E6,1
1,3D,90,13,8D,E6,11,60,BD,E2,11,D0                   BP
·168 DATA 03,20,08,13,DE,E2,11,60,FE,E2,1
1,D0,03,20,86,13,60,20,00,13,60,20                   CN
·170 DATA 04,13,60,20,12,13,60,20,00,13,4
C,2F,13,20,04,13,4C,12,13,20,1E,13                   NF
·172 DATA 60,20,00,13,4C,3F,13,20,04,13,4
C,3F,13,00,AD,4F,13,0A,AA,AD,00,DC                   NJ
·174 DATA 29,0F,85,FE,A9,0F,38,E5,FE,85,F
E,D0,01,60,A5,FE,0A,18,69,70,8D,70                   HL
·176 DATA 13,6C,78,13,27,13,2B,13,65,13,2
F,13,33,13,39,13,65,13,3F,13,43,13                   AC
·178 DATA 49,13,AD,E6,11,1D,91,13,8D,E6,1
1,60,BF,40,7F,80,00,9C,A2,EA,AD,47                   KE
·180 DATA 14,29,01,F0,09,A9,00,8D,7E,11,A
9,01,85,FD,60,EA,A5,FD,D0,FA,AD,D7                   JK
·182 DATA 11,CD,95,13,B0,01,60,AD,D7,11,C
D,96,13,90,09,AD,1B,D0,09,01,8D,1B                   LO
·184 DATA D0,60,AD,1E,D0,8D,94,13,AD,94,1
3,C9,41,D0,09,A9,01,85,FA,85,FC,4C                   GJ
·186 DATA E8,13,C9,81,D0,0F,A9,01,85,FB,8
5,FC,AD,15,D0,29,FE,8D,15,D0,60,4C                   KD
·188 DATA 98,13,AD,D7,11,C9,82,90,06,A9,5
4,8D,F8,1F,60,C9,78,90,06,A9,55,8D                   MB
·190 DATA F8,1F,60,C9,6E,90,06,A9,56,8D,F
8,1F,60,C9,64,90,06,A9,57,8D,F8,1F                   PK
·192 DATA 60,C9,5A,90,06,A9,58,8D,F8,1F,6
0,C9,50,90,06,A9,59,8D,F8,1F,60,C9                   AH
·194 DATA 46,90,06,A9,5A,8D,F8,1F,60,C9,3
C,90,05,A9,5B,8D,F8,1F,60,C1,AD,1F                   MH
·196 DATA D0,8D,47,14,AD,47,14,29,40,C9,4
0,F0,08,A9,01,85,FC,8D,00,0B,60,AD                   JD
·198 DATA 47,14,29,80,C9,80,F0,07,A9,01,8
5,FC,8D,01,0B,60,00,EA,AD,4F,13,A8                   KJ
·200 DATA 0A,AA,BD,E3,11,C9,B7,90,06,A9,3
F,99,FE,1F,60,C9,AD,90,06,A9,3E,99                   GN
·202 DATA FE,1F,60,C9,A3,90,06,A9,3D,99,F
E,1F,60,C9,9C,90,06,A9,3C,99,FE,1F                   AE
·204 DATA 60,C9,95,90,06,A9,3B,99,FE,1F,6
0,C9,90,90,06,A9,3A,99,FE,1F,60,C9                   HB
·206 DATA 8C,90,06,A9,39,99,FE,1F,60,C9,8
2,90,05,A9,38,99,FE,1F,60,C0,EA,78                   GE
·208 DATA A9,DA,8D,14,03,A9,14,8D,15,03,5
8,60,20,48,14,20,F4,13,AD,70,14,F0                   BH
·210 DATA 03,20,72,14,A5,FC,D0,06,20,AA,1
3,20,50,13,4C,65,FA,EA,EA,EA,EA,EA                   CH
·212 DATA EA,EA,EA,EA,EA,EA,C0,00,00,C0,0
0,00,00,00,00,00,00,00,00,00,00,00                   ND
·214 DATA 00,00,00,00,00,00,00,00,00,00,0
0,00,00,00,00,00,00,00,00,00,00,00                   EL
·216 DATA 00,00,00,00,00,00,00,00,00,00,0
0,00,00,00,00,00,00,00,00,00,00,00                   NF
·218 DATA 00,00,00,00,90,00,00,F0,00,00,6
0,00,00,90,00,00,00,00,00,00,00,00                   KF
·220 DATA 00,00,00,00,00,00,00,00,00,00,0
0,00,00,00,00,00,00,00,00,00,00,00                   LB
·222 DATA 00,00,00,00,00,00,00,00,00,00,0
0,00,00,00,00,00,00,00,00,00,00,00                   LD
·224 DATA 00,00,38,00,00,B0,00,00,F8,00,0
0,34,00,00,70,00,00,00,00,00,00,00                   LC
·226 DATA 00,00,00,00,00,00,00,00,00,00,0
0,00,00,00,00,00,00,00,00,00,00,00                   DP
·228 DATA 00,00,00,00,00,00,00,00,00,00,0
0,00,00,00,00,00,00,00,00,00,00,00                   JJ
·230 DATA 63,80,00,66,00,00,3C,00,00,3C,0
0,00,E6,00,00,06,00,00,00,00,00,00                   BB
·232 DATA 00,00,00,00,00,00,00,00,00,00,0
0,00,00,00,00,00,00,00,00,00,00,00                   OF
·234 DATA 00,00,00,00,00,00,00,00,00,00,0
0,00,00,00,00,00,00,00,00,00,0E,00                   HM
·236 DATA 00,1C,00,00,98,00,00,FF,C0,00,0
C,40,00,1C,00,00,38,00,00,00,00,00                   HP
·238 DATA 00,00,00,00,00,00,00,00,00,00,0
0,00,00,00,00,00,00,00,00,00,00,00                   MD
·240 DATA 00,00,00,00,00,00,00,00,00,00,0
0,00,00,00,00,00,00,00,E0,78,00,60                   AH
·242 DATA E0,00,31,C0,00,1F,00,00,1B,C0,0
0,30,E0,00,E0,60,00,00,60,00,00,00                   DB
·244 DATA 00,00,00,00,00,00,00,00,00,00,0
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IMPORTANT! Letters on white background are **Bug Repellent** line codes. **Do not enter them!** Pages 61 and 62 explain these codes and provide other essential information on entering ***Ahoy!*** programs. Refer to these pages **before** entering any programs!

```
0,00,00,00,00,00,00,00,00,00,00,00            OJ
•246 DATA 00,00,00,00,00,00,00,00,00,00,0
0,00,00,00,00,00,03,80,00,07,00,00            FF
•248 DATA 07,00,00,87,00,00,FF,F8,00,7F,F
C,00,07,0C,00,07,00,00,07,00,00,0E            PG
•250 DATA 00,00,00,00,00,00,00,00,00,00,0
0,00,00,00,00,00,00,00,00,00,00,00            PH
•252 DATA 00,00,00,00,00,00,00,00,00,00,0
0,00,00,00,C0,0F,00,E0,1E,00,F0,3C            EB
•254 DATA 00,78,78,00,1E,F0,00,03,C0,00,0
F,F0,00,1F,78,00,3C,1C,00,78,0E,00            AF
•256 DATA F0,07,00,E0,03,00,00,00,00,00,0
0,00,00,00,00,00,00,00,00,00,00,00            EN
•258 DATA 00,00,00,00,00,00,00,00,00,00,0
0,00,00,78,A9,0E,8D,14,03,A9,17,8D            DO
•260 DATA 15,03,58,60,AD,1F,D0,29,01,F0,0
A,A9,00,8D,7E,11,85,FC,4C,65,FA,AD            OP
•262 DATA D7,11,C9,F0,B0,EF,20,F4,13,4C,6
5,FA,00                                       BG
•264 REM  **  SPRITE  DATA  **                DG
•266 DATA 00,00,00,00,00,00,00,00,00,00,0
0,00,00,00,00,00,00,00,00,00,00,00            AE
•268 DATA 00,00,00,00,00,00,00,00,00,00,0
0,00,78,00,00,FC,00,00,FC,00,00,78            BA
•270 DATA 00,00,00,00,00,00,00,00,00,00,0
0,00,00,00,00,00,00,00,00,00,00,00            OA
•272 DATA 00,00,00,00,00,00,00,00,00,00,0
0,00,00,00,00,00,00,00,00,00,00,00            OC
•274 DATA 00,00,00,00,00,00,00,78,00,00,F
C,00,00,FC,00,00,FC,00,00,78,00,00            GB
•276 DATA 00,00,00,00,00,00,00,00,00,00,0
0,00,00,00,00,00,00,00,00,00,00,00            CO
•278 DATA 00,00,00,00,00,00,00,00,00,00,0
0,00,00,00,00,00,00,00,00,00,00,00            AI
•280 DATA 00,00,00,00,00,7C,00,00,FE,00,0
0,FE,00,00,FE,00,00,7C,00,00,00,00            MB
•282 DATA 00,00,00,00,00,00,00,00,00,00,0
0,00,00,00,00,00,00,00,00,00,00,00            JE
•284 DATA 00,00,00,00,00,00,00,00,00,00,0
0,00,00,00,00,00,00,00,00,00,00,00            JG
•286 DATA 7C,00,00,FE,00,01,FF,00,01,FF,0
0,01,FF,00,00,FE,00,00,7C,00,00,00            NL
•288 DATA 00,00,00,00,00,00,00,00,00,00,0
0,00,00,00,00,00,00,00,00,00,00,00            HC
•290 DATA 00,00,00,00,00,00,00,00,00,00,0
0,00,00,00,00,00,00,00,00,00,7C,00            AA
•292 DATA 01,FF,00,03,FF,80,03,FF,80,03,F
F,80,01,FF,00,00,7C,00,00,00,00,00            HJ
•294 DATA 00,00,00,00,00,00,00,00,00,00,0
0,00,00,00,00,00,00,00,00,00,00,00            FI
•296 DATA 00,00,00,00,00,00,00,00,00,00,0
0,00,00,00,00,FF,00,01,FF,80,03,FF            KM
•298 DATA C0,03,FF,C0,03,FF,C0,03,FF,C0,0
1,FF,80,00,FF,00,00,00,00,00,00,00            JC
•300 DATA 00,00,00,00,00,00,00,00,00,00,0
0,00,00,00,00,00,00,00,00,00,00,00            KG
•302 DATA 00,00,00,00,00,00,00,00,00,00,7
E,00,01,FF,80,03,FF,C0,07,FF,E0,07            HA
•304 DATA FF,E0,07,FF,E0,07,FF,E0,03,FF,C
0,01,FF,80,00,7E,00,00,00,00,00,00            FK
•306 DATA 00,00,00,00,00,00,00,00,00,00,0
0,00,00,00,00,00,00,00,00,00,00,00            EM
•308 DATA 00,00,00,00,00,00,00,00,FF,00,0
3,FF,C0,07,FF,E0,0F,FF,F0,0F,FF,F0            NG
•310 DATA 0F,FF,F0,0F,FF,F0,07,FF,E0,03,F
F,C0,00,FF,00,00,00,00,00,00,00,00            IM
•312 DATA 00,00,00,00,00,00                   LK
```

128 BASIC SCROLLER
FROM PAGE 27

```
•100 REM         AHOY! PRESENTS:              PI
•110 REM       "128 BASIC SCROLLER"           LC
•120 REM  (C) 1987 BY MR. SHAWN K SMITH       PO
•130 REM ===== ALL RIGHTS DESERVED =====      CG
•140 REM C-128: 40 AND 80 COLUMN VERSION      KA
•150 BANK 15:TC=47921:A=0                     OD
•160 PRINT CHR$(147):PRINT:PRINTCHR$(18);
" 128 BASIC SCROLLER "                        MD
•170 PRINT:PRINT"STORING DATA [3"."] ONE
MOMENT PLEASE!                                NA
•180 S = DEC("1400"):REM* RELOCATABLE STA
RTING ADDRESS!                                BG
•190 READY$:DO:POKES+A,DEC(Y$):C=C+DEC(Y$
):A=A+1                                       LA
•200 READY$:LOOP UNTIL Y$="EOD"               FJ
•210 PRINT:PRINT:IF C-TC THEN BEGIN           CI
•220 PRINTCHR$(18)"[4"*"] RECHECK DATA ST
ATEMENTS [4"*"]"                              DD
•230 STOP:BEND                                ME
•240 REM*  HANDLE RELOCATION OF ML CODE N
 RAM                                          FC
•250 IF S <> 5120 THEN BEGIN : REM RELOCA
TION REQUESTED                                KN
•260 PRINT:PRINT"DATA OK. ADJUSTING ML FO
R NEW STARTING ADDRESS"                       MB
•270 PRINT                                    KG
•280 DEF FNA(D)=((PEEK(D)=32 OR PEEK(D)=7
6 OR PEEK(D)=140) AND (PEEK(D+2)=20 OR P
EEK(D+2)=21))                                 CH
•290 DEF FNH(D)=INT(D/256):DEF FNL(D)=D-F
NH(D)*256:POKES+1,FNL(S+34):POKES+3,FNH(
S+34)                                         DD
•300 FOR T=S TO S+A                           PC
•310 IF FN A(T) THEN PRINT". ";:TB=(PEEK(
T+1)+PEEK(T+2)*256)-5120:POKE(T+1),FNL(S
```

```
+TB):POKE(T+2),FNH(S+TB):T=T+2              LK
•320 NEXT:BEND:PRINT                         NB
•330 PRINT"STORAGE:";S"-";S+A:PRINT:PRINT FM
•340 POKES+10,PEEK(828):POKES+12,PEEK(829
)                                            KE
•350 SYS(S)                                  KG
•360 PRINT CHR$(18)"128 BASIC SCROLLER AC
TIVATED!":PRINT                              MA
•370 PRINT"DISABLE/REENABLE: SYS";S          HG
•380 REM* ML CODE IN HEXIDECIMAL FORMAT * EA
•390 DATA A9,22,A2,14,EC,3D,03,D0,04,A9     CG
•400 DATA AD,A2,C6,78,AC,3C,03,8C,33,14     BB
•410 DATA AC,3D,03,8C,34,14,8D,3C,03,8E     AH
•420 DATA 3D,03,58,60,24,7F,30,0C,78,48     PP
•430 DATA C9,11,F0,0F,C9,91,F0,0B,68,58     PB
•440 DATA 4C,AD,C6,20,62,15,68,D0,F6,85     EO
•450 DATA AF,A5,E4,24,AF,10,02,A5,E5,C5     JK
•460 DATA EB,D0,E7,A5,EC,C5,E6,D0,E1,24     AK
•470 DATA D7,30,0B,2C,26,0A,30,03,20,03     PD
•480 DATA C7,20,03,C7,20,49,15,20,81,92     II
•490 DATA 1B,4A,00,24,AF,10,03,4C,D5,14     PO
•500 DATA 20,73,15,D0,10,A5,EB,C5,E5,F0     HM
•510 DATA BC,20,81,92,91,1B,4A,00,4C,6E     AN
•520 DATA 14,A5,F8,48,A9,00,85,F8,20,62     MF
•530 DATA 15,A9,11,20,69,92,20,64,50,B0     JK
•540 DATA 06,68,85,F8,4C,30,14,20,B5,15     GM
•550 DATA 86,61,85,62,20,B5,15,D0,0E,A9     KB
•560 DATA 8D,20,69,92,20,69,92,A6,2D,A5     DG
•570 DATA 2E,D0,E9,A0,02,20,B7,15,20,23     LP
•580 DATA 51,A9,00,85,F4,20,81,92,1B,4A     IA
•590 DATA 00,68,85,F8,68,58,60,4C,35,14     GP
•600 DATA 4C,30,14,20,73,15,D0,10,A5,EB     KK
•610 DATA C5,E4,F0,EF,20,81,92,1B,4B,8D     PM
•620 DATA 00,4C,D5,14,20,62,15,20,64,50     CF
•630 DATA 90,E0,A6,61,A5,62,E4,2D,D0,18     HL
•640 DATA C5,2E,D0,14,20,81,92,1B,49,1B     OI
•650 DATA 49,00,AD,10,12,38,E9,02,AA,AD     MP
•660 DATA 11,12,E9,00,86,AB,85,AC,A6,2D     CB
•670 DATA A5,2E,86,61,85,62,20,B5,15,E4     PM
•680 DATA AB,D0,04,C5,AC,F0,05,20,B5,15     KO
•690 DATA D0,EC,20,81,92,1B,49,00,A0,02     BG
•700 DATA 20,B7,15,20,23,51,A9,00,85,F4     LE
•710 DATA 20,81,92,8D,13,00,68,58,60,A5     DK
•720 DATA EC,85,AD,A5,EB,85,AE,A9,2C,A2     NL
•730 DATA 03,A0,00,20,BA,FF,20,C0,FF,A2     LG
•740 DATA 2C,4C,C6,FF,A9,2C,20,C3,FF,20     BH
•750 DATA CC,FF,A5,AD,85,EC,A5,AE,85,EB     MD
•760 DATA 60,A9,00,85,AA,85,16,85,17,20     KP
•770 DATA E4,FF,C9,30,30,30,C9,3A,10,2C     DM
•780 DATA 48,06,16,26,17,A5,16,A4,17,06     BN
•790 DATA 16,26,17,06,16,26,17,18,65,16     FD
•800 DATA 85,16,98,65,17,85,17,68,38,E9     NO
•810 DATA 30,18,65,16,85,16,90,02,E6,17     NI
•820 DATA E6,AA,D0,C9,A5,AA,60,A0,00,20     BO
•830 DATA EC,42,AA,C8,4C,EC,42,EA           JL
•840 DATA "EOD" :REM END-OF-DATA MARKER!  CG
```

FLAG HUNT
FROM PAGE 29

Starting address in hex: C000
Ending address in hex: C77F
SYS to start: 49152

Flankspeed **required for entry! See page 63.**

```
C000: 4C F7 C0 CE 42 03 AD 42 09
C008: 03 F0 01 60 AE 43 03 BD 10
C010: D6 C6 8D 2B D0 8D 2C D0 C1
C018: E8 E0 08 D0 02 A2 00 8E ED
C020: 43 03 A9 20 8D 42 03 60 63
C028: A2 00 8A 9D 00 3E 9D 00 CE
C030: 3F E8 D0 F7 A0 00 84 FB 42
C038: A9 3E 85 FC A2 00 A9 00 EE
C040: 85 02 BD DE C6 91 FB E8 A1
C048: 18 A5 FB 69 03 85 FB E6 D6
C050: 02 A5 02 A5 02 C9 08 D0 44
C058: E9 18 A5 FB 69 28 85 FB 0F
C060: A5 FC 69 00 85 FC C9 40 F8
C068: D0 D4 60 A2 00 A0 00 A9 5B
C070: 6B 91 FB A9 07 91 FD C8 72
C078: 91 FD A9 73 91 FB 18 A5 70
C080: FB 69 28 85 FB 85 FD A5 B8
C088: FC 69 00 85 FC 69 D4 85 35
C090: FE E8 E0 05 D0 D7 60 A2 0A
C098: 00 BD 1E C7 20 D2 FF E8 18
C0A0: E0 24 D0 F5 A9 0E 8D 20 D1
C0A8: D0 8D 21 D0 A2 00 A9 09 4E
C0B0: 9D A0 D8 9D 68 D9 9D 30 75
C0B8: DA 9D F8 DA 9D C0 DB A9 E8
C0C0: 63 9D A0 04 9D 68 05 9D 0F
C0C8: 30 06 9D F8 06 9D C0 07 01
C0D0: E8 E0 28 D0 D9 A9 00 85 9C
C0D8: 02 A6 02 BD 42 C7 85 FB CC
C0E0: 85 FD BD 49 C7 85 FC 49 FE
C0E8: DC 85 FE 20 6B C0 E6 02 7F
C0F0: A5 02 C9 07 D0 E3 60 20 9E
C0F8: 97 C0 20 28 C0 AD 00 DC E4
C100: 29 10 F0 F9 AD 01 DC 29 D8
C108: 10 F0 F2 A2 00 BD 50 C7 74
C110: 20 D2 FF E8 E0 2A D0 F5 BD
C118: AD 00 DC 29 10 D0 F9 AD 54
C120: 01 DC 29 10 D0 F2 A2 00 9D
C128: A9 20 9D 28 04 E8 E0 28 AD
C130: D0 F8 20 A5 C1 20 EC C1 50
C138: 20 BD C1 AD 1E D0 29 03 A0
C140: D0 F9 20 0B C5 20 B9 C4 9A
C148: 20 84 C4 20 72 C1 20 03 29
C150: C0 20 90 C2 20 51 C2 AD 66
C158: 4A 03 F0 E6 8D 17 D0 8D 80
C160: 1D D0 4A 0A AA A9 A4 9D 39
C168: 00 D0 A9 92 9D 01 D0 4C 31
C170: F7 C0 CE 48 03 AD 48 03 3C
C178: D0 13 AD 49 03 49 01 8D 2E
C180: 49 03 8D 8B D8 8D A4 DB CC
C188: A9 10 8D 48 03 A9 20 A8 8D
```

```
C190: AE 44 03 D0 02 A9 86 AE 38
C198: 45 03 D0 02 A0 86 8D A4 0D
C1A0: 07 8C 8B 04 60 A9 01 A2 71
C1A8: 01 9D 3C 03 E8 E0 0E D0 2F
C1B0: F8 A9 00 8D 44 03 8D 45 FA
C1B8: 03 8D 4A 03 60 A9 00 AA 4B
C1C0: 9D 00 D4 E8 E0 18 D0 F8 DE
C1C8: A9 0F 8D 18 D4 A9 09 8D 3C
C1D0: 05 D4 A9 14 8D 01 D4 A9 75
C1D8: 80 8D 04 D4 A9 65 8D 0C 68
C1E0: D4 A9 05 8D 08 D4 A9 20 98
C1E8: 8D 0B D4 60 A2 FA 8E F8 DB
C1F0: 07 8E F9 07 CA 8E FA 07 E2
C1F8: 8E FB 07 CA 8E FC 07 8E 76
C200: FD 07 A9 00 8D 10 D0 8D AA
C208: 17 D0 8D 1C D0 8D 1D D0 E5
C210: 8D 29 D0 8D 1B D0 8D 2A C8
C218: D0 A9 0D 8D 27 D0 A9 02 D0
C220: 8D 28 D0 A2 B8 8E 00 D0 61
C228: A2 B0 8E 08 D0 A2 70 8E 84
C230: 02 D0 A2 78 8E 0A D0 A0 28
C238: 4A 8C 01 D0 A0 52 8C 09 69
C240: D0 A0 EA 8C 03 D0 A0 F2 90
C248: 8C 0B D0 A9 33 8D 15 D0 01
C250: 60 AC 01 D0 AE 00 D0 AD 5C
C258: 10 D0 29 01 D0 12 E0 B0 D7
C260: D0 0E C0 4A D0 0A AD 44 17
C268: 03 F0 05 A9 01 8D 4A 03 E6
C270: AC 03 D0 AE 02 D0 AD 10 30
C278: D0 29 02 D0 12 E0 78 D0 81
C280: 0E C0 EA D0 0A AD 45 03 0B
C288: F0 05 A9 02 8D 4A 03 60 65
C290: AD 01 DC 85 02 AD 00 D0 22
C298: 85 FB AD 01 D0 85 FC A9 C5
C2A0: 01 85 FE 2D 10 D0 85 FD B7
C2A8: AD F8 07 85 14 20 07 C3 DA
C2B0: A5 14 8D F8 07 A5 FE 49 E5
C2B8: FF 2D 10 D0 05 FD 8D 10 67
C2C0: D0 A4 FC A6 FB 8C 01 D0 34
C2C8: 8E 00 D0 AD 00 DC 85 02 3A
C2D0: AD 02 D0 85 FB AD 03 D0 54
C2D8: 85 FC A9 02 85 FE 2D 10 C8
C2E0: D0 85 FD AD F9 07 85 14 7D
C2E8: 20 07 C3 A5 14 8D F9 07 1C
C2F0: A5 FE 49 FF 2D 10 D0 05 F1
C2F8: FD 8D 10 D0 A4 FC A6 FB A9
C300: 8C 03 D0 8E 02 D0 60 A6 C8
C308: FE DE 3B 03 BD 3B 03 F0 11
C310: 01 60 A9 12 9D 3B 03 A4 AD
C318: FC A6 FB A5 02 29 03 C9 55
C320: 03 D0 03 4C 15 C4 C0 4A 28
C328: 90 33 C0 73 B0 2F A5 02 A7
C330: 29 01 D0 04 C0 4A F0 25 50
C338: A5 02 29 02 D0 04 C0 72 13
C340: F0 1B A5 FD D0 0B E0 50 FC
C348: 90 13 E0 59 B0 03 4C EB 12
C350: C3 E0 10 90 08 E0 19 B0 48
C358: 04 A5 FD D0 F1 C0 72 90 86
C360: 24 C0 9B B0 20 A5 02 29 82
C368: 01 D0 04 C0 72 F0 16 C0 39
C370: 9A D0 06 A5 02 29 02 F0 A5
C378: 0C A5 FD D0 08 E0 B8 90 2B
C380: 04 E0 C1 90 66 C0 9A 90 0A
C388: 32 C0 C3 B0 2E A5 02 29 EE
C390: 01 D0 04 C0 9A F0 24 A5 7C
C398: 02 29 02 D0 04 C0 C2 F0 0F
C3A0: 1A A5 FD D0 0A E0 68 90 13
C3A8: 12 E0 71 90 3E B0 0C E0 79
C3B0: 48 90 08 E0 51 B0 04 A5 1E
C3B8: FD D0 30 C0 C2 90 56 C0 E2
C3C0: EB B0 52 A5 02 29 01 D0 52
C3C8: 04 C0 C2 F0 48 A5 02 29 5A
C3D0: 02 D0 04 C0 EA F0 3E A5 28
C3D8: FD D0 3A E0 20 90 36 E0 8A
C3E0: 29 90 08 E0 D8 90 2E E0 FB
C3E8: E1 B0 2A A5 02 29 01 D0 48
C3F0: 02 88 88 A5 02 29 02 D0 A7
C3F8: 02 C8 C8 C0 4A B0 02 A0 EA
C400: 4A C0 EA 90 02 A0 EA A5 B9
C408: 14 C9 FF F0 02 A9 FC 49 C8
C410: 03 85 14 84 FC A4 FC C0 90
C418: 4A F0 10 C0 72 F0 0C C0 54
C420: 9A F0 08 C0 C2 F0 04 C0 EC
C428: EA D0 58 A5 02 29 0C C9 E2
C430: 0C F0 50 85 02 A6 FB 29 D0
C438: 04 D0 0E CA CA A9 FD A4 FC
C440: 14 C0 FD D0 02 A9 FE 85 14
C448: 14 A5 02 29 08 D0 0E E8 FC
C450: E8 A9 FB A4 14 C0 FB D0 25
C458: 02 A9 FA 85 14 E0 00 D0 4A
C460: 04 A5 FE 85 FD E0 FE D0 3D
C468: 04 A9 00 85 FD E0 18 B0 43
C470: 06 A5 FD D0 02 A2 18 E0 88
C478: 50 90 06 A5 FD F0 02 A2 98
C480: 50 86 FB 60 AC 01 D0 AE E0
C488: 00 D0 AD 10 D0 29 01 D0 E2
C490: 0D E0 78 D0 09 C0 EA D0 4D
C498: 05 A9 01 8D 44 03 AC 03 CC
C4A0: D0 AE 02 D0 AD 10 D0 29 AA
C4A8: 02 D0 0D E0 B0 D0 09 C0 B4
C4B0: 4A D0 05 A9 01 8D 45 03 51
C4B8: 60 AD 1E D0 29 03 85 02 69
C4C0: 29 01 F0 20 A9 00 8D 44 77
C4C8: 03 A2 20 AD 10 D0 29 FE 45
C4D0: 8D 10 D0 A9 B8 8D 00 D0 FF
C4D8: A9 4A 8D 01 D0 8E 0B D4 9A
C4E0: E8 8E 0B D4 A5 02 29 02 0B
C4E8: F0 20 A9 00 8D 45 03 A2 1C
C4F0: 20 8E 0B D4 E8 8E 0B D4 D6
C4F8: AD 10 D0 29 FD 8D 10 D0 1D
C500: A9 80 8D 02 D0 A9 EA 8D AC
C508: 03 D0 60 CE 40 03 AD 40 3C
C510: 03 F0 03 4C 79 C5 A9 02 3E
C518: 8D 40 03 AE 04 D0 AC 05 1E
C520: D0 86 FB 84 FC A9 04 85 28
C528: FD 2D 10 D0 85 FE AD 46 AC
```

IMPORTANT! Letters on white background are **Bug Repellent** line codes. **Do not enter them!** Pages 61 and 62 explain these codes and provide other essential information on entering ***Ahoy!*** programs. Refer to these pages **before** entering any programs!

```
C530: 03 85 02 20 71 C6 A6 FB B5
C538: A4 FC A9 FB 2D 10 D0 05 92
C540: FE 8D 10 D0 8E 04 D0 8C 9D
C548: 05 D0 AE 06 D0 AC 07 D0 28
C550: 86 FB 84 FC A9 08 85 FD 89
C558: 2D 10 D0 85 FE AD 47 03 E2
C560: 85 02 20 71 C6 A6 FB A4 87
C568: FC A9 F7 2D 10 D0 05 FE 19
C570: 8D 10 D0 8E 06 D0 8C 07 D7
C578: D0 AD 15 D0 48 AD 01 DC B0
C580: 29 1F 49 1F 85 02 29 10 F1
C588: F0 5D CD 3E 03 D0 58 A5 B4
C590: 02 29 0F F0 52 A9 04 85 41
C598: FD AD 15 D0 29 04 D0 47 6F
C5A0: AD 10 D0 29 01 85 FE AD 8B
C5A8: 00 D0 85 FB AD 01 D0 85 FF
C5B0: FC A5 02 29 0F 85 02 20 35
C5B8: 71 C6 20 71 C6 20 71 C6 A1
C5C0: 20 71 C6 20 71 C6 A5 FB 13
C5C8: 8D 04 D0 A5 FC 8D 05 D0 31
C5D0: A5 02 8D 46 03 A9 FB 2D 22
C5D8: 10 D0 05 FE 8D 10 D0 AD D9
C5E0: 15 D0 05 FD 8D 15 D0 AD EA
C5E8: 01 DC 29 10 8D 3E 03 AD 7C
C5F0: 00 DC 29 1F 49 1F 85 02 06
C5F8: 29 10 F0 5D CD 3F 03 D0 61
C600: 58 A5 02 29 0F F0 52 A9 25
C608: 08 85 FD AD 15 D0 29 08 58
C610: D0 47 AD 10 D0 29 02 85 67
C618: FE AD 02 D0 85 FB AD 03 C9
C620: D0 85 FC A5 02 29 0F 85 D8
C628: 02 20 71 C6 20 71 C6 20 FA
C630: 71 C6 20 71 C6 20 71 C6 19
C638: A5 FB 8D 06 D0 A5 FC 8D 6E
C640: 07 D0 A5 02 8D 47 03 A9 41
C648: F7 2D 10 D0 05 FE 8D 10 EF
C650: D0 AD 15 D0 05 FD 8D 15 5A
C658: D0 AD 00 DC 29 10 8D 3F B9
C660: 03 68 CD 15 D0 F0 09 A2 1C
C668: 80 8E 04 D4 E8 8E 04 D4 A0
C670: 60 A5 FE F0 08 C5 FD F0 23
C678: 04 0A 4C 75 C6 85 FE A6 3A
C680: FB A4 FC A5 02 29 01 F0 E0
C688: 01 88 A5 02 29 02 F0 01 D6
C690: C8 A5 02 29 04 F0 01 CA EA
C698: A5 02 29 08 F0 01 E8 E0 2D
C6A0: FF D0 04 A9 00 85 FE E0 84
C6A8: 00 D0 04 A5 FD 85 FE 86 2C
C6B0: FB 84 FC C0 2C 90 14 C0 80
C6B8: F8 B0 10 E0 12 B0 04 A5 BF
C6C0: FE F0 08 E0 54 90 0E A5 32
C6C8: FE F0 0A A5 FD 49 FF 2D DC
C6D0: 15 D0 8D 15 D0 60 01 0F 9A
C6D8: 0C 0B 00 0B 0C 0F FF 7E 94
C6E0: 3C 18 00 00 00 00 00 00 35
C6E8: 00 38 10 00 00 00 3C 3C A9
C6F0: 18 1E 18 1C 12 1B 3C 3C 01
C6F8: 18 1E 18 18 68 4C BC BC 8D
C700: 98 7E 18 3E 63 03 3C 3C 4C
C708: 18 78 18 38 48 D8 3C 3C 82
C710: 18 78 18 18 16 32 3D 3D 93
C718: 19 7E 18 7C C6 C0 93 1F 7E
C720: 20 20 20 20 20 20 20 20 21
C728: C6 4C 41 47 20 C8 55 4E 50
C730: 54 20 20 42 59 20 CA 4F 9A
C738: 48 4E 20 C6 45 44 4F 52 E0
C740: 08 0E A7 BF 7C 3A 56 F9 C4
C748: 10 04 04 05 06 06 06 07 7E
C750: 13 11 D4 4F 20 53 54 41 A1
C758: 52 54 2C 20 42 4F 54 48 79
C760: 20 50 4C 41 59 45 52 53 A2
C768: 20 4D 55 53 54 20 50 52 95
C770: 45 53 53 20 42 55 54 54 BC
C778: 4F 4E 00 00 00 00 00 00 16
```

FRACTAL RECREATIONS

FROM PAGE 18

FRACTAL DECODER

```
•1 REM===================================== NM
•2 REM                                      JD
•3 REM         FRACTAL DECODER              IA
•4 REM                                      JF
•5 REM  RE-CREATE COMPLEX IMAGES FROM       PL
•6 REM  CONCISE DATA.                       MH
•7 REM                                      JE
•8 REM        RUPERT REPORT #61             OI
•9 REM                                      JG
•10 REM======= C-128 ONLY ============= CF
•15 REM ================== GET DATA ==== JO
•20 RESTORE 1000   :REM SELECT IMAGE DATA  MP
•30 READ JMAX :REM # OF TRANSFORMS         CC
•40 PT=0 :REM CUMULATIVE PROBABILITY       FO
•50 FOR J=1 TO JMAX                        LG
•60 READ A(J),B(J),C(J),D(J),E(J),F(J),PB MO
•70 PT=PT+PB                               JD
•80 P(J)=PT                                JA
•90 NEXT                                   NM
•100 REM =========   INITIALIZE   ======= NI
•110 XN=1000: XX=-1000: YN=1000: YX=-1000 LI
•120 GM=RGR(0) :IF GM>5 THEN GM=5:    REM
  SAVE GFX MODE                            LJ
•130 KY$="": GRAPHIC 0,1                   OI
•140 PRINT"INITIALIZING . . ."             KK
•150 FOR JN=1 TO 100                       MD
•160 PRINT JN;                             AF
```

```
·170 RN=RND(0)                                DN
·175 REM RANDOMLY PICK A TRANSFORM            OH
·180 FOR J=1 TO JMAX                          BI
·190 JJ=J: IF P(J)>RN THEN J=JMAX             HB
·200 NEXT: J=JJ                               BM
·210 REM  NEXT X AND Y VALUES                 AF
·220 NX=A(J)*X+B(J)*Y+E(J)                    EE
·230 NY=C(J)*X+D(J)*Y+F(J)                    EI
·240 X=NX: Y=NY: REM SAVE THEM                ID
·250 REM IGNORE FIRST 10 RESULTS              BM
·260 IF JN<10 THEN GOTO 310                   BB
·270 IF X>XX THEN XX=X :REM SAVE MIN,MAX      LH
·280 IF X<XN THEN XN=X                        LA
·290 IF Y>YX THEN YX=Y                        LM
·300 IF Y<YN THEN YN=Y                        JM
·310 NEXT JN: PRINT                           CG
·320 REM MAKE WINDOW 10% LARGER               AI
·330 XN=(1-.1*SGN(XN))*XN                     CK
·340 XX=(1+.1*SGN(XX))*XX                     PD
·350 YN=(1-.1*SGN(YN))*YN                     OF
·360 YX=(1+.1*SGN(YX))*YX                     EK
·370 REM SET UP VIEWPORT & WORLD COORDS       FF
·380 WL=XN: WR=XX: WB=YN: WT=YX               FG
·390 VL=1: VR=318: VB=1: VT=198               OI
·400 XA=(VR-VL)/(WR-WL)                       CL
·410 XB=VL-XA*WL                              PN
·420 YC=(VT-VB)/(WT-WB)                       DA
·430 YD=VB-YC*WB                              AF
·440 REM =============   MAIN LOOP   ====     BI
·450 GRAPHIC 1,1: KY$=""                      CK
·460 DO WHILE KY$=""                          HA
·470 RN=RND(0)                                GA
·480 FOR J=1 TO JMAX                          GB
·490 JJ=J: IF P(J)>RN THEN J=JMAX             GE
·500 NEXT                                     HH
·510 J=JJ                                     JE
·520 NX=A(J)*X+B(J)*Y+E(J)                    EK
·530 NY=C(J)*X+D(J)*Y+F(J)                    JG
·540 X=NX: Y=NY                               LC
·550 XS=XA*X+XB: YS=YC*Y+YD: REM SCALE PT     CD
·555 REM CLIP PT & SAVE AS MIN OR MAX         AE
·560 IF XS>VR THEN XS=VR+1: IF XX<X THEN
 XX=X                                         DN
·570 IF XS<VL THEN XS=VL-1: IF XN>X THEN
 XN=X                                         LC
·580 IF YS>VT THEN YS=VT+1: IF YX<Y THEN
 YX=Y                                         FL
·590 IF YS<VB THEN YS=VB-1: IF YN>Y THEN
 YN=Y                                         NA
·600 DRAW ,XS,200-YS : REM PLOT PT            CK
·610 GET KY$                                  MG
·620 LOOP :REM REPEAT IF NO KEYPRESS          HA
·630 REM----------------------------------    PA
·635 REM  USE SPACE BAR TO RE-CALIBRATE
  WINDOW SIZE; ANY OTHER KEY TO END.          EN
·640 IF KY$=" " THEN GRAPHIC1,1: GOTO 380     HE
·650 GRAPHIC GM : STOP                        MK
·660 KY$="": GRAPHIC 0: GRAPHIC 1: GOTO 4
60 :REM TYPE 'CONT' TO CONTINUE               IE
·980 REM ================================     CE
·985 REM FIRST DATA ITEM IS                   MN
·990 REM      # OF TRANSFORMS                 CN
·991 REM OTHER DATA ITEMS FOR EACH
         TRANSFORM:                           HG
·992 REM    DATA A, B, C, D, E, F, PROB       CO
·993 REM WHERE A-F ARE FROM SOLVER            AP
·994 REM AND PROB IS BETWEEN 0 & 1.00         GC
·995 REM    NOTE: SUM OF PROB'S SHOULD        MK
·996 REM          BE 1.00                     LH
·999 REM ================================     HL
·1000 DATA 4:  REM TRIANGLES                  BO
·1010 DATA .5,0,0,.5,0,0,.32                  LD
·1020 DATA .5,0,0,.5,1,1,.32                  JF
·1030 DATA .5,0,0,.5,0,2,.32                  PG
·1040 DATA .125,0,0,.125,.5,1.75,.04          DH
·1999 REM                                     GH
·2000 DATA 2:  REM  SPIRAL                    BK
·2010 DATA .92,-.08,.7,.92,.17,.5,.9          LE
·2020 DATA -.16,-.05,.05,-.16,.5,.5,.1        DH
·2999 REM                                     FD
·3000 DATA 2:  REM FOSSIL SNAIL (AMMONOID
 FROM THE JURASSIC PERIOD)                    LP
·3010 DATA .95,-.08,.49,.95,.17,.5,.9         JN
·3020 DATA -.25,-.07,.07,-.25,1.3,.7,.1       LD
·3999 REM                                     DP
·4000 DATA 4:  REM  SQUARES                   FK
·4010 DATA .45,0,0,.45,0,0,.25                AO
·4020 DATA .45,0,0,.45,.65,0,.25              LK
·4030 DATA .45,0,0,.45,.55,.55,.25            OG
·4040 DATA .45,0,0,.45,0,.55,.25              KJ
·4999 REM                                     CL
·5000 DATA 2:  REM NORTHERN LIGHTS            BK
·5010 DATA .99,0,0,.99,0,.2,.8                FL
·5020 DATA -.2,-.4,.4,.2,-.2,-.2,.2           DE
·5999 REM                                     BH
·6000 DATA 7:  REM HEXAGONS                   GO
·6010 DATA .33,0,0,.33,.33,1,.14              HK
·6020 DATA .33,0,0,.33,.67,.5,.14             IK
·6030 DATA .33,0,0,.33,.67,1.5,.14            FF
·6040 DATA .33,0,0,.33,1.67,1,.16             FN
·6050 DATA .33,0,0,.33,1,1,.14                KO
·6060 DATA .33,0,0,.33,1.33,.5,.14            DA
·6070 DATA .33,0,0,.33,1.33,1.5,.14           KE
·6999 REM                                     AD
·7000 DATA 4:  REM FERN                       BJ
·7010 DATA .2,-.26,.23,.22,0,1.6,.07          CE
·7020 DATA .85,.04,-.04,.85,0,1.6,.85         LI
·7030 DATA -.15,.28,.26,.24,0,.44,.06         NO
·7040 DATA 0,0,0,.16,0,0,.02                  JH
```

SOLVER

```
·1 REM====================================    NM
·2 REM                                        JD
```

IMPORTANT! Letters on white background are **Bug Repellent** line codes. **Do not enter them!** Pages 61 and 62 explain these codes and provide other essential information on entering ***Ahoy!*** programs. Refer to these pages **before** entering any programs!

```
•3 REM          SOLVER                        FK
•4 REM                                        JF
•5 REM  CALCULATE TRANSFORMATION              HK
•6 REM  COEFFICIENTS FOR COLLAGE IMAGES.      CF
•7 REM                                        JE
•8 REM       RUPERT REPORT #61                OI
•9 REM===================================     MP
•10 REM USE GAUSS-SEIDEL METHOD FOR           JI
•11 REM SOLVING SIMULTANEOUS EQUATIONS.       HO
•12 REM                                       JN
•13 REM X1*A + Y1*B + E             = X1'     PF
•14 REM X2*A + Y2*B + E             = X2'     OJ
•15 REM X3*A + Y2*B + E             = X3'     PC
•16 REM             X1*C + Y1*D + F = Y1'     BC
•17 REM             X2*C + Y2*D + F = Y2'     AO
•18 REM             X3*C + Y3*D + F = Y3'     CC
•19 REM === SOLVE FOR A,B,C,D,E,F =======     DB
•20 REM                                       KF
•30 REM OLD COORDS X,Y : NEW COORDS X',Y'     CB
•35 REM       3 POINTS: 1,2,3                 PI
•40 DATA 0,0                :REM X1, Y1       DA
•41 DATA 0,0                :REM X1',Y1'      JO
•42 DATA 2,2                :REM X2,Y2        DM
•43 DATA 1,1                :REM X2',Y2'      JG
•44 DATA 0,4                :REM X3,Y3        DE
•45 DATA 0,2                :REM X3',Y3'      MA
•90 REM---- INIT; READ DATA  -------          FN
•100 DIM A(6,7), B(6,7)                       GJ
•110 NROW=6: NCOL=7                           PB
•120 FOR J=1 TO 3                             AF
•130 READ A(J,1),A(J,2),A(J,7),A(J+3,7)       KP
•140 A(J+3,4)=A(J,1)                          JN
•150 A(J+3,5)=A(J,2)                          IH
•160 A(J,3)=1                                 LP
•170 A(J+3,6)=1                               JK
•180 FOR K=4 TO 6                             CA
•190 A(J,K)=0                                 AC
•200 A(K,J)=0                                 PO
•210 NEXT K                                   KF
•220 NEXT J                                   KA
•230 REM--- CALL SOLVING ROUTINE:             CL
•240 GOSUB 1000                               DO
•250 PRINT "A, B, C, D, E, F:"                BN
•260 PRINT A(1,7), A(2,7), A(4,7),            IC
•270 PRINT A(5,7), A(3,7), A(6,7)             IL
•280 END                                      JJ
•1000 :REM SOLVE FOR A,B,C,D,E,F              NN
•1010 FOR K=1 TO NROW                         JI
•1020 PV=A(K,K)             :REM PIVOT        NL
•1030 IL=K                                    KB
•1040 FOR M=K+1 TO NROW                       KF
•1045 IF M>NROW THEN 1080                     GL
•1050 IF ABS(A(M,K)) < ABS(PV) THEN 1080      NC
•1060 PV=A(M,K)                               LO
•1070 IL=M                                    MP
•1080 NEXT                                    LO
•1100 FOR N=1 TO NCOL                         MM
•1110 TMP=A(K,N): A(K,N)=A(IL,N): A(IL,N)
=TMP                                          MI
•1120 NEXT                                    OG
•1130 FOR J=1 TO NCOL                         OG
•1140 B(K,J)=A(K,J)/PV                        BP
•1150 NEXT                                    AE
•1160 FOR I=1 TO NROW                         CJ
•1170 IF I=K THEN 1210                        MO
•1180 FOR J=1 TO NCOL                         CI
•1190 B(I,J)=A(I,J)-A(I,K)*B(K,J)             ND
•1200 NEXT J                                  HI
•1210 NEXT I                                  IL
•1220 FOR I=1 TO NROW                         GF
•1230 FOR J=1 TO NCOL                         FK
•1240 A(I,J)=B(I,J)                           GJ
•1250 NEXT J                                  LC
•1260 NEXT I                                  LN
•1270 NEXT K                                  MN
•1280 RETURN                                  JD
```

REVOLVER
FROM PAGE 46

REVOLVER

```
•100 REM **********************               OA
•110 REM ***    REVOLVER      ***             DL
•120 REM ***    (C) 1988      ***             IP
•130 REM *** BY EARL KANADY ***               ID
•140 REM **********************               AI
•150 FOR X=2816 TO 2911: READ A: POKE X,A
: NEXT                                        NJ
•160 BSAVE "REVOLVE", P2816 TO P2911:END      HF
•170 DATA 165,134,133,80,165,133,133,81       OL
•180 DATA 165,132,133,82,165,81,133,134       DE
•190 DATA 165,82,133,133,165,80,133,132       HO
•200 DATA 120,165,216,9,255,133,216,165       EI
•210 DATA 1,41,254,133,1,169,0,133            JF
•220 DATA 250,133,252,169,28,133,251,169      NI
•230 DATA 216,133,253,162,4,165,134,10        ML
•240 DATA 202,208,252,24,101,132,133,80       MP
•250 DATA 160,0,165,80,145,250,165,133        HE
•260 DATA 145,252,136,208,245,230,253,230     FH
•270 DATA 251,165,251,201,32,208,235,169      PJ
•280 DATA 160,133,216,88,76,77,107,0          CP
```

REVOLVER DEMO

```
•10 REM ******************************        MG
•15 REM *** REVOLVER GRAPHICS DEMO ***        AK
•20 REM ***         (C) 1988       ***        CL
•25 REM ***      BY EARL KANADY    ***        DM
```

```
·30 REM ******************************          NK
·35 GRAPHIC1,1:GRAPHIC0,1:DIMSA(40),EA(40
)                                               FL
·40 BLOAD"REVOLVE"                              IF
·45 GRAPHIC0,0:COLOR0,1:COLOR4,1:COLOR5,4       MM
·50 PRINT"[CLEAR][6"[DOWN]"]"TAB(8)"[RVSO
N] REVOLVER GRAPHICS DEMOS "                    BI
·55 PRINTTAB(8)"[RVSON]  "                      GO
·60 PRINTTAB(8)"[RVSON] 1[RVSOFF]  ROTATI
NG WHEELS"                                      FP
·65 PRINTTAB(8)"[RVSON]  "                      IA
·70 PRINTTAB(8)"[RVSON] 2[RVSOFF]  ACTION
 FRAME"                                         MH
·75 PRINTTAB(8)"[RVSON]  "                      HC
·80 PRINTTAB(8)"[RVSON] 3[RVSOFF]  ENERGY
 RADIATION"                                     PA
·85 PRINTTAB(8)"[RVSON]  "                      IE
·90 PRINTTAB(8)"[RVSON] 4[RVSOFF]  SAUCER
S IN SPACE"                                     AB
·95 PRINTTAB(8)"[RVSON]  "                      JG
·100 PRINTTAB(8)"[RVSON] 5[RVSOFF]  SPINN
ING SPIRAL"                                     DO
·105 PRINTTAB(8)"[RVSON]  "                     KI
·110 PRINTTAB(8)"[RVSON] 6[RVSOFF]  END D
EMONSTRATIONS"                                  JA
·115 PRINTTAB(8)"[RVSON]  [RVSOFF]"             CE
·120 PRINTTAB(8)"[RVSON][4" "]PLEASE SELE
CT ONE[4" "]"                                   KE
·125 GETKEYA$:IFVAL(A$)<1ORVAL(A$)>6THEN1
25                                              DB
·130 A=VAL(A$):IFA=1THENGOSUB160:GOTO45         AO
·135 IFA=2THENGOSUB245:GOTO45                   GC
·140 IFA=3THENGOSUB345:GOTO45                   CN
·145 IFA=4THENGOSUB400:GOTO45                   GF
·150 IFA=5THENGOSUB480:GOTO45                   BP
·155 PRINT"[CLEAR]":END                         MP
·160 REM*** WHEELS.DEMO                         OL
·165 C(0)=8:C(1)=15:C(2)=3                      AB
·170 COLOR0,1:COLOR4,1:COLOR1,C(0):COLOR2
,C(1):COLOR3,C(2):GRAPHIC3,1                    CE
·175 FOR T=0 TO 360 STEP 10                     LA
·180 N=N+1:IFN>3THENN=1                         KI
·185 CIRCLEN,50,55,22,33,T,T+10,,1              FJ
·190 DRAWN,RDOT(0),RDOT(1) TO 50,55             HP
·195 NEXT:N=3                                   LE
·200 FOR T=0 TO 360 STEP 4                      JL
·205 N=N-1:IFN<1THENN=3                         KE
·210 CIRCLEN,98,130,46,69,T,T+4,,1              NE
·215 DRAWN,RDOT(0),RDOT(1) TO 98,130            NH
·220 NEXT                                       FO
·225 FOR X=1 TO 250                             NJ
·230 SYS2840:FORD=1 TO 5:NEXTD                  BG
·235 C(3)=C(0):C(0)=C(1):C(1)=C(2):C(2)=C
(3)                                             PE
·240 COLOR1,C(0):COLOR2,C(1):COLOR3,C(2):
NEXTX:RETURN                                    EN
·245 REM*** FRAME.DEMO                          NI
·250 GRAPHIC0,1                                 GC
·255 COLOR0,1:COLOR4,1:COLOR1,8:COLOR2,6:
COLOR3,3:GRAPHIC3,1                             OD
·260 H=10:W=25:N=3:PH=25:PW=10                  FC
·265 FORX=1TO15:BOXN,PW,PH,PW+W,PH+H,,1         CP
·270 PH=PH+H:N=N+1:IFN>3THENN=1                 DF
·275 NEXT                                       JG
·280 H=10:W=25:N=1:PH=25:PW=127                 OD
·285 FORX=1TO15:BOXN,PW,PH,PW+W,PH+H,,1         OD
·290 PH=PH+H:N=N-1:IFN<1THENN=3                 PM
·295 NEXT                                       KK
·300 H=9:W=9:N=2:PH=25:PW=36                    CM
·305 FORX=1TO10:BOXN,PW,PH,PW+W,PH+H,,1         GC
·310 PW=PW+W:N=N-1:IFN<1THENN=3                 HJ
·315 NEXT                                       LO
·320 H=10:W=9:N=3:PH=165:PW=36                  KH
·325 FORX=1TO10:BOXN,PW,PH,PW+W,PH+H,,1         MG
·330 PW=PW+W:N=N+1:IFN>3THENN=1                 OK
·335 NEXT:FOR X=1 TO 250                        AD
·340 SYS2816:FORD=1 TO 10:NEXTD:NEXTX:RET
URN                                             KF
·345 REM*** RADIATION.DEMO                      FP
·350 GRAPHIC0,0:COLOR0,1:COLOR4,1:GRAPHIC
3,1:K=1:N=4                                     JA
·355 C(1)=15:C(2)=7:C(3)=2                      GJ
·360 FORT=72TO0STEP-4:N=N-1:IFN<1THENN=3        FG
·365 COLORN,C(N)                                KK
·370 CIRCLEN,79,99,T*1.4,T*2,,,,1               HE
·375 NEXT                                       PK
·380 FORX=1 TO 83                               EH
·385 SYS2816:FORD=1 TO 30:NEXTD                 NP
·390 SYS2816:FORD=1 TO 20:NEXTD                 PL
·395 SYS2816:FORD=1 TO 10:NEXTD:NEXTX:RET
URN                                             JM
·400 REM*** DEMONSTRATION OF ROTATING           LJ
·405 GRAPHIC0,1:COLOR0,1:COLOR4,1:COLOR1,
11:COLOR2,15:COLOR3,2:GRAPHIC3,1                BF
·410 FORS=1 TO 200:H=INT(RND(1)*160)+1:N=
INT(RND(1)*3)+1                                 AM
·415 V=INT(RND(1)*200)+1:DRAWN,H,V:NEXT         GC
·420 N=0:CR=14:FORT=0 TO 360 STEP 4             JH
·425 N=N+1:IFN>3THENN=1                         LO
·430 CIRCLEN,55,145,50,27,T,T+4,,1              DH
·435 DRAWN,RDOT(0),RDOT(1) TO 55,125            OP
·440 NEXT                                       DL
·445 FOR T=0 TO 360 STEP 4                      IB
·450 N=N-1:IFN<1THENN=3                         KK
·455 CIRCLEN,105,45,40,20,T,T+4,,1              FH
·460 DRAWN,RDOT(0),RDOT(1) TO 105,30            AH
·465 NEXT                                       FE
·470 FORX=1 TO 250                              MD
·475 SYS2816:FORD=1TO15:NEXTD:NEXTX:RETUR
N                                               AD
·480 REM*** SPIRAL.DEMO                         PP
·485 COLOR0,1:COLOR1,11:COLOR2,3:COLOR3,2
:COLOR4,1:GRAPHIC3,1                            GC
·490 GOSUB585:N=0                               IH
·495 FORR=33 TO 1 STEP -2:FORX=1TO40:N=N-
1:IFN<1THENN=3                                  ML
```

```
•500 CIRCLEN,79,99,R*2,R*3,SA(X),EA(X),,2 KH
•505 NEXTX:NEXTR:COLOR1,11:COLOR2,3:COLOR
 3,2:FORX=1 TO 2:FORK=1 TO 21              OJ
•510 SYS2816:FOR D=1 TO 10:NEXTD:NEXTK     FD
•515 COLOR1,11:COLOR2,7:COLOR3,2:FORK=1 T
 O 21                                      EE
•520 SYS2816:FOR D=1 TO 15:NEXTD:NEXTK     GF
•525 COLOR1,15:COLOR2,7:COLOR3,2:FORK=1 T
 O 21                                      CK
•530 SYS2816:FOR D=1 TO 15:NEXTD:NEXTK     LP
•535 COLOR1,15:COLOR2,6:COLOR3,2:FORK=1 T
 O 21                                      BP
•540 SYS2816:FOR D=1 TO 15:NEXTD:NEXTK     JJ
•545 COLOR1,4:COLOR2,6:COLOR3,2:FORK=1 TO
  21                                       JA
•550 SYS2816:FORD=1 TO 15:NEXTD:NEXTK      HD
•555 COLOR1,4:COLOR2,7:COLOR3,2:FORK=1 TO
  21                                       OB
•560 SYS2816:FORD=1 TO 15:NEXTD:NEXTK      GN
•565 COLOR1,15:COLOR2,7:COLOR3,2:FORK=1 T
 O 21                                      DC
•570 SYS2816:FORD=1 TO 15:NEXTD:NEXTK      IH
•575 COLOR1,15:COLOR2,3:COLOR3,2:FORK=1 T
 O 21                                      KA
•580 SYS2816:FORD=1 TO 15:NEXTD:NEXTK:NEX
 TX:RETURN                                 MH
•585 FORX=1 TO 40:READ SA(X):READEA(X)     ED
•590 IFSA(X)=999 THEN RETURN               KP
•595 NEXT:RETURN                           JK
•600 DATA 351,0,0,9,9,18,18,27,27,36,36,4
 5,45,54,54,63,63,72,72,81,81,90,90,99     CM
•605 DATA 99,108,108,117,117,126,126,135,
 135,144,144,153,153,162,162,171,171,180,
 180,189,189,198                           EJ
•610 DATA 198,207,207,216,216,225,225,234
 ,234,243,243,252,252,261,261,270,270,279  MI
•615 DATA 279,288,288,297,297,306,306,315
 ,315,324,324,333,333,342,342,351,999,999  CE
```

REVIEWS

Continued from page 60

with the guardians. Death, when it comes, is by pollution, after falling into water which is apparently even more foul than Boston Harbor.

The towers rotate so that the player is always in the center of the screen. On each level, a passageway shortcuts the player-character to the other side of the tower. If the player makes contact with one of the tower guardians or obstacles, he is bumped back a varying number of levels.

Conquering each of the eight towers wins the player a trip on the MK.7 sub that brought him, and a bonus game. In this horizontally scrolling contest, the player uses a mounted stun gun to daze as many fish as possible, then collects his catch by passing over them before reaching the base of the next tower.

Tower Toppler treats action puzzles in a genuinely cute, and more-or-less original manner. It's just too bad that it is marred by a malady common to much modern software design: the dreaded one-function-too-many syndrome. Games afflicted with this disease would play just fine on an IBM or one of the new videogame systems with two action buttons. The single button configuration, however, can cause even a good design to fail.

In this case, the player-character can be walked left or right with the joystick controller, and the up/down commands make him enter the passageways (up) or use the elevators (up/down).

That left two functions, shooting and jumping, and one command, the joystick button. Designer John M. Phillips solved this problem by changing the function of the button depending on what the onscreen hero is doing. If the player-character is moving, pressing the button will elicit a jump, whereas if he is standing still it will fire his weapon.

In a game as frenetic as this, where jumping and shooting often follow each other in rapid fashion, this is unsatisfactory. *Tower Toppler* is plenty tough on its own, with its slippery steps and roving obstacles. This kind of complicated control scheme needlessly handicaps users. Even after extensive play, users will still see their surrogate jump when they call for a shot and vice versa. Why the heck didn't the designers use the upper right joystick position for a jump to the right and an upper left command for a jump to the left (a mechanic used successfully by dozens of games)?

A seemingly small annoyance like this, when added to the game's built-in legitimate handicaps, may be enough to send many users over the frustration brink.

Otherwise, the game is quite impressive. The vertically scrolling graphics on the tower games are very appealing, with cartoonlike charm that contrasts nicely with more horrific elements like the gigantic, bouncing eyeballs that guard the Tower of Eyes.

The graphics on the bonus game are a mixed success. The ocean background is really hot, a fascinating blend of shimmering colors that suggests some of the terrifying beauty of a poisoned ocean. The fish are rendered less successfully, without any depth. But the real problem here is the lack of any sound effect or graphic to confirm that a fish has in fact been captured.

Tower Toppler is a near-miss that could have been a cult classic.

Epyx, 600 Galveston Dr., Redwood City, CA 94063 (phone: 415-366-0606).

–Bill Kunkel

FLOTSAM

We welcome letters on any aspect of Commodore computing, or anything else under the sun. Write to *Flotsam*, c/o *Ahoy!*, Ion International Inc., 45 West 34th Street–Suite 500, New York, NY 10001.

Could any of your sources assist me with an interface problem? I am attempting to use the C-64 version of *Newsroom* with an Epson Homewriter 10 printer. *Newsroom's* documentation does not list the Homewriter 10. I have used the logical drivers: 801, 803, etc. I phoned Epson, the manufacturer of *Newsroom*, and the store that sold me the printer. No luck. Help!

—John Elliott
Truro, NS

If any of our readers can help Mr. Elliott, please write to him care of us. We'll forward your letter to him, and print your explanation here to aid other readers who may be experiencing a similar problem.

I'll admit it. I find your magazine very impressive, although a year or so ago I was skeptical when you boldly proclaimed yourselves #1 in Commodore coverage.

For the past five years, I have been an exclusive user of Commodore home computers. I have considered all the others and found that they all fall short in one major area—PRICE—as I am often financially in a crunch. I find myself at a loss to see how the other companies can justify their exorbitant prices for a product that does little more (sometimes) than a Commodore 64.

In 1983 I bought my first computer—the VIC 20—and enjoyed it for at least a year before I upgraded to the 64. Then about a year or so later I again upgraded to the 128. I have since purchased a 128D and am thoroughly satisfied, despite the rumors of the 128D having a few bugs.

I look forward each month to your latest issue and being able to type in the programs, a practice I never tire of. Your magazine is top quality as to content and accuracy, while the others are full of "Mickey Mouse" programs, errors, and *just plain garbage.* Oh, they have the occasional "good stuff," but one gets tired of waiting for it. *Ahoy!*, however, has all the "right stuff" and then some each month. Keep up the good work!

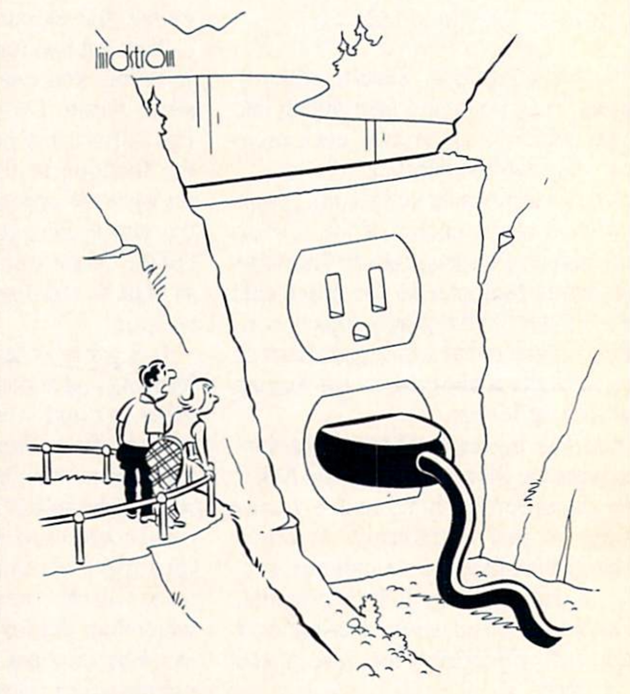
—John Hibbs
London, ONT

Let me commend you on a remarkable magazine! My oldest son has issues dating back to early 1985, which he has given to his little brother Ted along with his C-64 and 1541. Ted is now driving me nuts each month to pick up the current copy of *Ahoy!* from the Stars and Stripes here on base.

Ted and his friends input the games each month, then try to modify them—sometimes screwing them all up. Ted seems to have the advantage, and he's getting better all the time. He goes through all the back issues, reading the step by step explanations.

I guess the old C-64 will get at least another 4+ years on it. I know your magazine alone took my oldest son from "fear" to "cheer" using a computer. Hats off to you all!

—TSgt. Darryll A. Devine
APO NY



"I guess, somehow, I'd always thought of hydroelectric power as being more complicated."